JULY | 1956

products finishing

FINISHES ON METAL PRODUCTS

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Party Dress for a "Jubilee Celebration" dryer

Dressed up and going places, is this sparkling, new, "Jubilee Celebration" line of Hamilton Dryers. Designed to celebrate the 75th anniversary of this pioneer firm, special attention was given to insuring a rich, lasting finish with highest resistance to moisture, chemicals and heat.

The answer? KEMCLAD®—the Sherwin-Williams white-for-life appliance finish that stays bright, clean and stain-free.

KEMCLAD Appliance Finishes are adaptable to individual drying and production line needs . . . provide the technical advantages of the most extensive laboratories in the world devoted to paint research. Investigate what these or other Sherwin-Williams developments can do for you. Contact The Sherwin-Williams Co., General Industrial Division, Cleveland 1, Ohio, or Montreal.

Gold and black trim accentuates gleaming white KEMCLAD finish on new Hamilton Dryers.

SHERWIN-WILLIAMS

INDUSTRIAL FINISHES

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												2nd Cover			3rd Cover			4th Cover	
1	15	29	43	57	71	85	99	113	127	141	155								
2	16	30	44	58	72	86	100	114	128	142	156	169	182	195	208	221	234	247	260
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4	18	32	46	60	74	88	102	116	130	144	158	171	184	197	210	223	236	249	262
5	19	33	47	61	75	89	103	117	131	145	159	172	185	198	211	224	237	250	263
6	20	34	48	62	76	90	104	118	132	146	160	173	186	199	212	225	238	251	264
7	21	35	49	63	77	91	105	119	133	147	161	174	187	200	213	226	239	252	265
8	22	36	50	64	78	92	106	120	134	148	162	175	188	201	214	227	240	253	266
9	23	37	51	65	79	93	107	121	135	149	163	176	189	202	215	228	241	254	267
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11	25	39	53	67	81	95	109	123	137	151	165	178	191	204	217	230	243	256	269
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13	27	41	55	69	83	97	111	125	139	153	167	180	193	206	219	232	245	258	271
14	28	42	56	70	84	98	112	126	140	154	168	181	194	207	220	233	246	259	272

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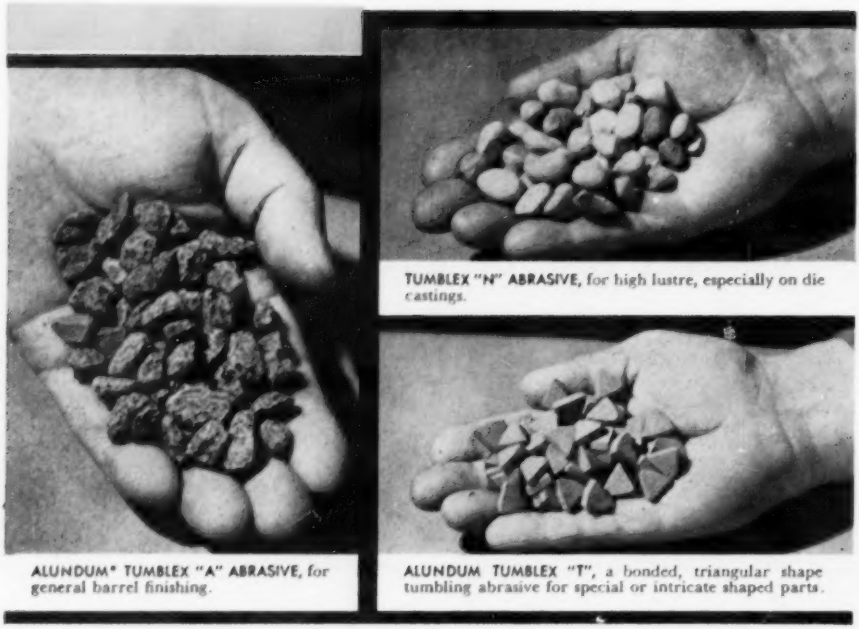

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products finishing

Vol. 20 No. 10 July, 1955

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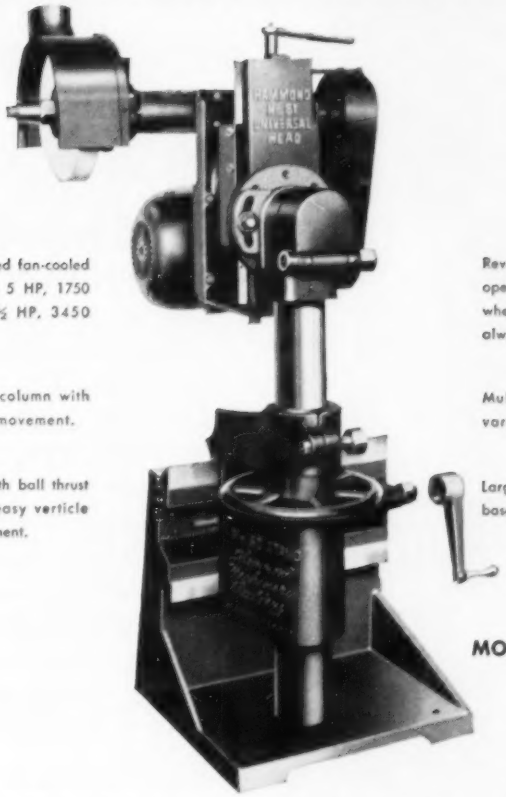

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with PENNSALT ELECTROCLEANER K-8

Pave the way to a smooth, bright plate with minimum rejects—use Pennsalt Cleaner K-8*, the KING OF ELECTROCLEANERS.

The high conductivity of K-8 lets high currents flow at moderate voltages, produces a strong electrolytic "scrubbing" action that removes the most stubborn heat-treating smuts, impacted mill oils, and drawing compounds. A new combination of surfactants and balanced alkalies in K-8 gives you cleaner steel or copper for a consistently better plate. And, once removed, soils are prevented from redepositing; suspended by the K-8 solution, they're easily rinsed off even in hard water.

Remember—where other cleaners fail, Pennsalt Electrocleaner K-8 cleans deep and sure. TRY K-8 IN YOUR CYCLE. Ask the Pennsalt man for a demonstration, or write Metal Processing Dept. 235, Pennsylvania Salt Manufacturing Company. East: Three Penn Center Plaza, Philadelphia 2, Pa.; West: 2020 Milvia Street, Berkeley 4, Calif. In Canada: Pennsalt Chemicals of Canada, Hamilton, Ontario.

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Metal Cleaners • Phosphate Coatings • Cold-Working Lubricants

A BETTER START FOR YOUR FINISH

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WHEN WASH WATER BOOTHS

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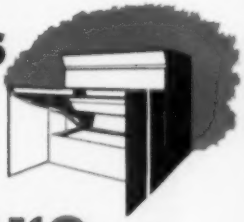

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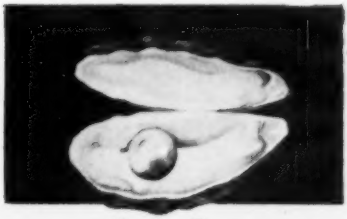

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**Nacromer is not suitable for use in pigmented enamels, high temperature bake-type synthetic resins containing formaldehyde, or paints. It is suitable for use over these coatings in a clear enamel or lacquer.*

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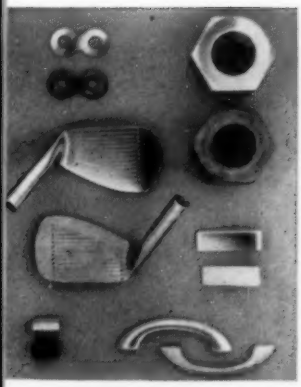

Before and After

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Send samples of your parts for a free evaluation.

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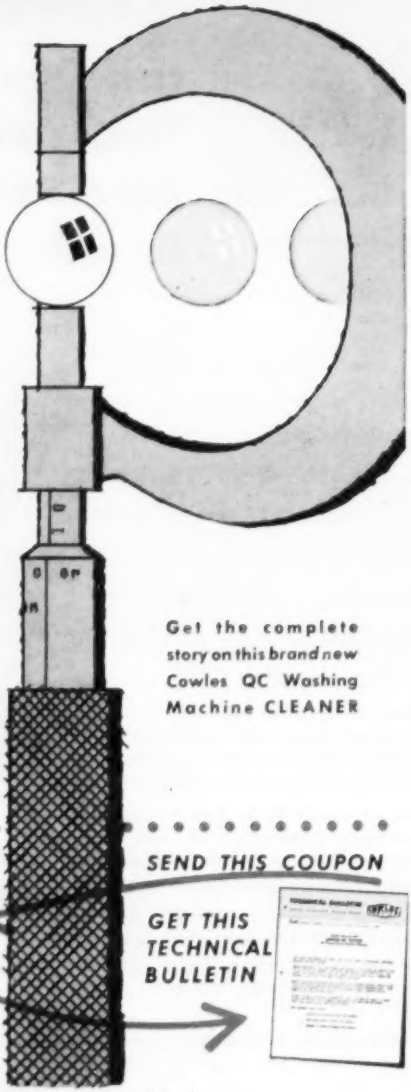
added wetting, penetrating, soil-loosening, emulsifying power in your washing machine

without excessive foaming



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Vol. 20, No. 10

JULY, 1956

. . . . editorial . . .

Now Is The Time:

To plan finishing department maintenance and installation projects which can be accomplished during the vacation "breather;" to take a critical look at your equipment, facilities, and organization.

To check over your exhaust systems; to clean and repair fans and ducts; to consider plastic ducts for corrosive service if replacement is indicated; to look into the possibility of installing air washers or fume scrubbers; generally, to take steps to provide better air movement and cleaner air for your plant.

To install or repair acid resistant floors and drains; to see if plastic pipe or glass pipe should be used in repairs or replacement; to repair tank linings, have tanks relined, or install new tanks; to clean and paint tank exteriors and other exposed metal surfaces.

To check electrical circuits thoroughly to be sure that no short circuits or sources of current loss exist; to perform any necessary repairs or maintenance on electrical equipment.

To study your present processes and handling methods to try to eliminate or reduce handling, and simplify process steps; to investigate new processes, methods, and equipment which may speed your production and cut costs; to review new materials and finishes which may give your product a more durable and attractive finish.

To study your organization and your people to see if you have the right man in the right job; to evaluate the progress each one has made; to see that those who deserve it receive proper recognition.

Actually, the suggestions offered above might form the basis of a checklist for routine review and study. Action taken on some of these points NOW can put you in a better competitive position for the busy months ahead.

Ezra A. Blount

—EDITOR

Fig. 1—Smithcraft Lighting Division of A. L. Smith Iron Co. now occupies two large plants in Chelsea, Mass. Large triangular area in foreground is the new, remodeled acquisition.

Finishing Fluorescent Fixt

Fluorescent lighting fixtures require a high quality, reflective painted surface. Smithcraft applies it efficiently in a new, modern installation.

SMITHCRAFT FIXTURES light industrial buildings (Fig. 2), offices, stores and schools all over the world. The finish on these products must be well-bonded, strong and uniform in thickness; it must retain its reflective and protective qualities for many years. The finish must, for practical production purposes, be applied rapidly yet carefully over surfaces of rather diverse complexity.

Smithcraft recently expanded its facilities into a remodeled plant (Fig. 1) adjacent to its old plant in Chelsea, Massachusetts, to provide for its continually increasing production needs. The finishing operation in this new plant is one of its outstanding features. Modern automatic operations have been combined into a system that meets the high quality standards necessary for this highly reputable product.

The exterior of the new Smithcraft plant hardly suggests the ultra-modern production facilities within. It is a large former box plant covering several acres north of Boston. Almost all of the buildings were erected early in the 1900's. A recent acquisition, it supplements the original plant on adjacent property. With the opening of these new facilities, Smithcraft production has been increased more than seventy per cent.

Inside, the plant is completely modern. Smithcraft completely con-

Fig. 2—View of typical industrial installation illuminated by Smithcraft lighting fixtures. This brightly lighted area is in the plant of a large automotive manufacturer.

res in Modernized Plant

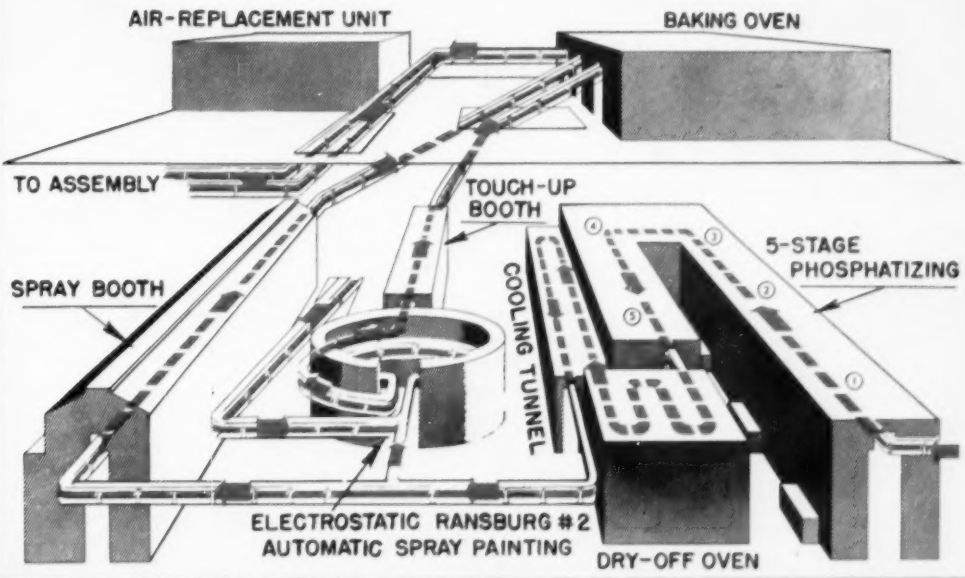

Fig. 3—Flow diagram shows how parts move through finishing cycle in new Smithcraft plant. Process begins at far right, ends at upper left, just prior to assembly operations.

verted the interior of the buildings, leaving only the brick outer shells to hint that they were originally erected in the gaslight era.

The steel storage building is the first stop for the formed products before they are finished.

The finish on Smithcraft fluorescent lighting fixtures is applied both by electrostatic and hand spray painting processes. The new plant uses the latest techniques in cleaning, phosphatizing, painting, baking and materials handling, integrated into a continuous "semi-automatic" procedure (Fig. 3).

Conveyor System

An overhead chain conveyor feeds the finishing and assembly processes from the steel storage area. The finishing conveyor system consists of two lines: one, Smithcraft calls the "main line," the other the "electrostatic line." Actually, the "electrostatic line" is a sort of spur track

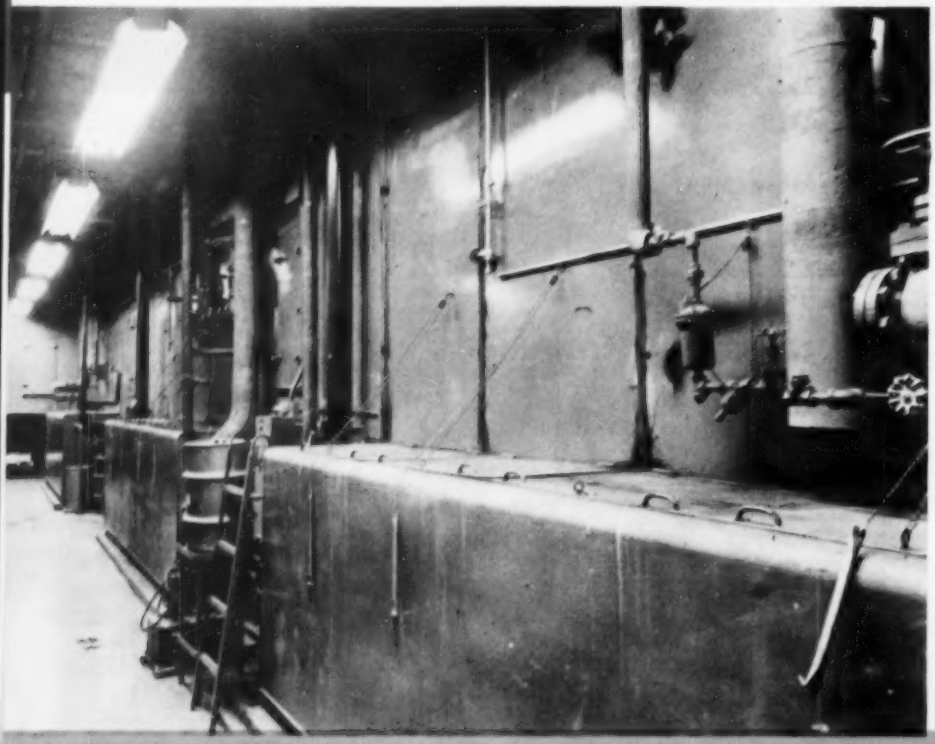

Fig. 4—A view of the Mahon 5-stage cleaning and phosphatizing tunnel used to prepare metal lighting fixtures for painting. Parts are oven dried before being painted.

Fig. 5—Parts for fluorescent lighting fixtures traveling around a Ransburg reciprocating disc atomizer. Paint particles are highly charged, thus are attracted to grounded work.

leading the work through the Ransburg No. 2 Process (after a phosphatizing treatment) and back to the "main line" just ahead of the assembly operations in the second floor of the main building.

The conveyors carry C-type hooks on two-foot centers. The "main line" conveyor is approximately 1,400 feet long and travels at 15 feet per minute. The "electrostatic line" or spur is approximately 700 feet long and travels at 8 feet per minute. Work traveling along the "main line" on the way to the electrostatic section is hung on intermediate hooks which are transferred at the end of the phosphatizing process and proceed through the Ransburg No. 2 Process and then to the assembly area. Work hangers of both lines return to the steel storage building to renew their respective cycles.

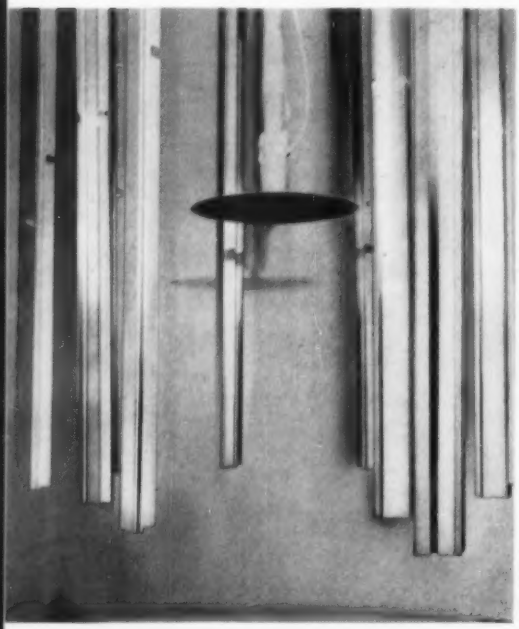

Fig. 6—Close-up of Ransburg reciprocating disc. It moves up and down to paint entire length of products hanging on the conveyor.

Metal Preparation

Phosphatizing is used at Smithcraft for improving corrosion resistance and to give surfaces a good paint base. This five-stage washer installation (Fig. 4) was made by the R. C. Mahon Co. It performs cleaning and phosphatizing operations automatically. The work is carried by the conveyor line through a series of tunnels where the following operations are performed:

1. Clean. Parts are sprayed for 60 seconds with solution of Parco 330 cleaner held at 180 deg. F.
2. Hot water rinse. Parts are rinsed for 60 seconds with water held at 160 deg. F.
3. Phosphatize. Parts are sprayed with solution of Bonderite 1000 for 60 seconds. Solution temperature, 165 deg. F.
4. Cold water rinse. 30 seconds.
5. Chromate rinse. Parts are rinsed in a solution of Parcolene No. 7, a chromic-phosphoric acid solution, for 30 seconds.

This is followed by a dry-off cycle of five minutes in a direct-fire oven at 350 deg. F. and 4¼ minutes on the conveyor to cool the parts before painting.

It is at this point that the work

either continues along the main conveyor line for hand spraying or is transferred to the other line for electrostatic coating.

Fixtures which, because of their design, are not suitable for electrostatic coating, remain on the "main line" to be carried to a 40-foot two-level water wash spray booth. This booth is equipped with three recirculating paint lines from a central mixing room. The operators can couple their spray guns to any one of these lines as required by the work. Down draft replacement of clean air at 80 deg. F. ensures efficient reduction of fumes and elimination of floating dirt and dust.

Electrostatic Painting

The electrostatic cycle begins where the appropriate pieces were taken off the intermediate hooks on the "main line" and transferred to the spur section. Electrostatic painting takes place in a circular booth (Fig. 5), with a segment open to allow the work to enter and exit on the conveyor line. Inside the paint shield is a Ransburg No. 2 Process reciprocating disc sprayer (Fig. 6). This system uses flat disc reciprocating electrostatic sprayers rotating in a horizontal plane at 900 r.p.m. The disc moves up and down from a ceiling-mounted hydraulically actuated cylinder. It makes a 120-inch

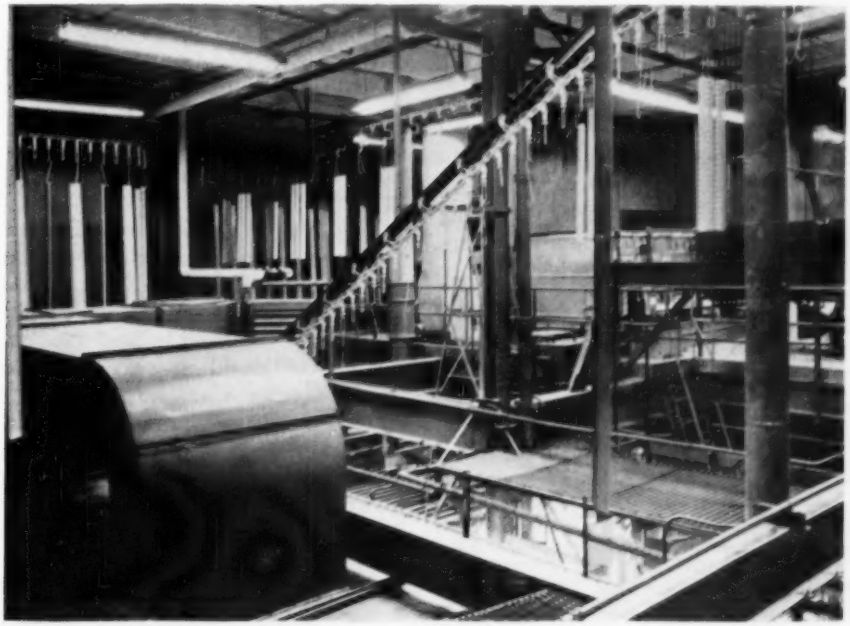

Fig. 7—Painted lighting fixture bodies enroute to the baking oven. At this point, they are passing over air replacement equipment that supplies clean, heated air to this plant. (Photos courtesy Smithcraft Lighting Div., A. L. Smith Iron Co., Chelsea, Massachusetts.)

stroke and travels in a vertical plane at 8 to 10 cycles per minute.

Paint is delivered to these sprayers at about 400 to 500 cubic centimeters per minute and the voltage potential at the disc is 90,000 volts. The parts on the conveyor are grounded. Thus, charged particles of paint seek the work as it moves past the disc. Lengths of vertical stroke and paint pressure can be controlled for various lengths of fixtures as they appear on the line, if necessary.

A small touch-up booth using a hand sprayer is used to reinforce corners and depressions in the work.

Baking

The fixtures on both the "main" and "electrostatic" lines are then carried (Fig. 7) to an indirect-fired oven, where the newly painted parts are baked for twenty minutes at 350 deg. F.

After this baking and drying process the fixture is carried to an assembly area and taken off the work hangers.

Air Makeup System

A makeup air system cleans, heats and filters air entering the plant assuring a constant supply of 80 deg. F. clean air. It replaces over 80,000 c.f.m. An auxiliary system that treats and moves an additional 15,000 c.f.m. of air has been incorporated to provide an ample margin under all conditions.

These units have been engineered to fit the special conditions in this type of finishing operation. For example, the forty-foot hand spray booth exhausts solvent- and paint-laden 80 deg. F. air at 50,000 c.f.m. The air replacement unit must supply, simultaneously, 50,000 c.f.m. of 80 deg. F. air to the top of the booth in order to avoid creating a negative pressure which would suck in dirt-laden air from outside the booth.

This maintenance of proper pressure to protect against the inflow of dirt-laden air that would spoil the newly-painted work is a factor throughout the finishing process for which Smithcraft has provided by ample air replacement facilities.

The heating system covering the painting process section alone has a capacity of 34 million B.t.u. per hour. This is approximately 63 per cent of that required to heat the Empire State Building or enough to heat 490 seven-room houses.

This plant is as modern as tomorrow, and Smithcraft has left nothing undone to assure efficient production and provide for future expansion. It has equipped its Chelsea plant with the latest laboratories and developments in industrial finishing in full recognition of the highly important part finishing plays in the manufacture, public acceptance and longevity of high quality products.

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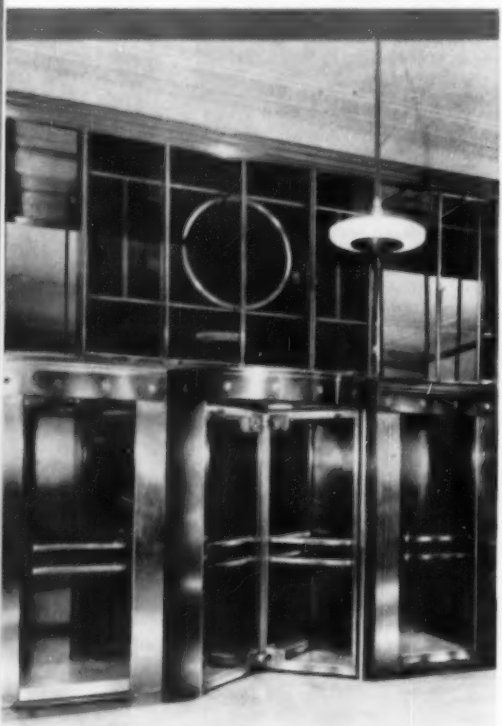
Surface Finishes for Stainless Steels

By KENNETH M. HUSTON
Senior Research Engineer
Armco Steel Corporation

THE SURFACE OF STAINLESS STEELS is normally resistant to a wide variety of corrosive environments. This property has been attributed by some to the presence of a thin transparent film of oxides which serves to retard corrosive action. Since this film re-forms after it has been stripped off or penetrated, it fortifies the entire body against attack by destructive agents. Thus, in effect, the stainless steels serve as noble metals in industry and for domestic use.



Because of their attractive appearance and useful properties, the application (Fig. 1) of stainless steels has expanded tremendously since their first commercial production some thirty years ago. About 80,715 ingot tons were melted in 1935 and over a million tons in 1953. Current reports are that 1955 has bettered 1953's record production by 142,100 tons. The rate of growth and the use of stainless steel by all classes of industry makes it imperative that metal finishers learn the proper procedures for finishing stainless steel. **One of the first steps** in applying any finish is to know what is being finished. Some knowledge of the stainless steel grades is essential to setting up procedures for handling them in the finishing room.

Armco mills have produced over 30 standard grades and 50 special grades of stainless steel in a single year. Each grade has a specific prop-

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Fig. 1—Polished stainless is used widely in architectural applications where appearance and corrosion resistance are important.

erty for some application, but generally the selection of any grade is a compromise between corrosion resistance and hardness; or machinability; or weldability; or some other particular property.

Stainless steels all contain over 11 per cent chromium and they fall into four general classifications.

The ten standard alloys in the first group contain chromium as the principal alloying element in amounts varying from about 11 to 18 per cent, carbon up to 1 per cent, and in some cases small amounts of other alloying elements, mainly sulfur or selenium, and nickel.

The standard alloys in the second group contain chromium as the principal alloying element in amounts varying from 13 to 27 per cent and carbon up to 0.35 per cent. The free-machining grade, Type 430F, contains about 0.3 per cent sulfur or se-

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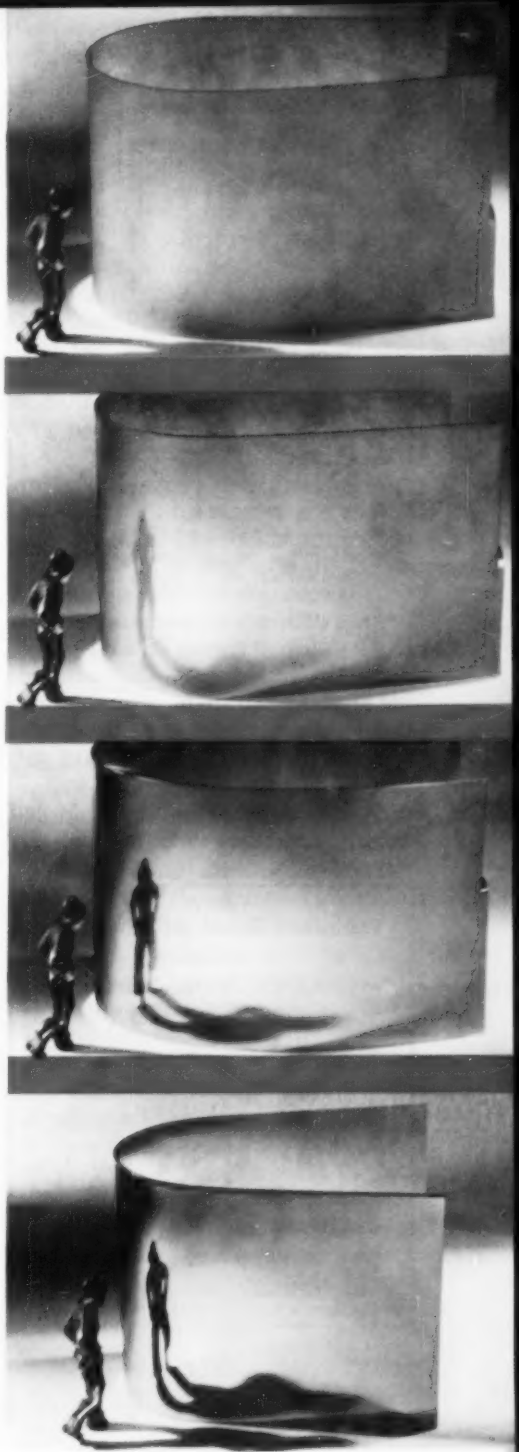

Fig. 2—Examples of some standard finishes on stainless steel. (Top to bottom) No. 1 is a white pickled surface produced from a hot-rolled, annealed and pickled sheet. It may be deep drawn and severely formed, and is usually used where no final polishing or buffing is required, such as on heavy-duty industrial equipment.

No. 2B finish has some lustre due to final light cold rolling. It is used for deep drawing and forming, including applications where final polishing is required.

No. 4 finish is the most popular polished finish. Sheets are ground and polished and are commercially free of surface imperfections. It is used where good appearance, ease of cleaning, corrosion resistance are desired.

No. 7 finish is produced by buffing the basic No. 4 finish. This results in a finish possessing a higher degree of lustre, but retaining residual polishing lines. (Figs. 1 and 2 courtesy Metalwash Machinery Corporation.)

lenium, and Type 405 contains about 0.3 per cent aluminum to improve its weldability.

The steels in the third group combine excellent corrosion resistance, high strength and hardness, and ability to be hardened by low temperature heat treatment. Armco 17-4 PH has copper as a precipitation hardening element and Armco 17-7 PH, aluminum.

The last and probably better-known group includes the 18-8 types and contains from 16 to 20 per cent nickel, in addition to 17 to 25 per cent chromium. Carbon may be as low as 0.03 per cent maximum in the ELC welding grades. Sulfur or selenium is added to the free-machining grade; titanium or columbium to the welding grades, and molybdenum to improve corrosion and pitting resistance.

Stainless steels may be obtained with a variety of finishes (Fig. 2).

Stainless Steel Applications by Industry
A.I.S.I. Data—First 6 Months, 1955

Automotive	47.5%
Domestic Appliances	15.9%
Process Equipment	15.3%
Aircraft	7.5%
Commercial Appliances	4.9%
Contractors	5.4%
Rail & Shipping	2.3%
Military	1.1%

Hot finished bar and rod stock is available in hot rolled or hot rolled and pickled finishes. Cold finished bars and wire may be obtained with cold drawn, turned, centerless ground or polished surfaces. The sheet is furnished with a No. 1 (hot rolled, annealed and pickled), No. 2D (dull full finish), No. 2B (bright full finish), No. 4 (standard polish), No. 6 (standard polish tampico finish), and No. 7 (high luster polish) finishes.

Scale Removal

The type of finish resulting from scale removal is one of the first to be considered by the finisher. Scale on stainless steel as the result of heating during or subsequent to fabrication must be removed to obtain satisfactory corrosion resistance.

Thorough scale removal is essential since small traces of scale left in crevices, threads, or places difficult to clean will tend to produce rust in a comparatively short time and detract from the appearance of the surface.

Recommended procedures for removing scale will be found in the Appendix to A.S.T.M. B254-53, "Recommended Practice for Preparation of and Electroplating on Stainless Steel." This covers such procedures as blasting, shot peening or wheel abrading, tumbling, wet tumbling, pickling, molten salt treatment and wire brushing.

Cleaning

In general, the methods employed in cleaning ordinary steel may be used for stainless steels.

Mineral and vegetable oils, paraffin, tallow or straw oils may be removed in suitable proprietary deter-

gents, in hot solutions of trisodium phosphate, sodium silicate, sodium aluminate or sodium borate containing small additions of free alkali; or organic solvents, such as carbon tetrachloride, trichloroethylene, perchloroethylene, kerosene or gasoline.

Surface dust and grease accumulations may be removed with soap or detergents and water and a soft cloth. Care should be taken in cleaning highly polished surfaces to prevent scratching from a harsh cloth or adhering abrasives.

A mixture of four parts of a sudsy synthetic detergent solution and one part trichloroethylene (or one of the other chlorinated hydro-carbon solvents) will generally remove stamped trademarks, stencil marks, grease pencil marks, fingerprints, oil, grease, tar, wax and other oil stains.

The mixture should be stirred vigorously and then applied to the soil with a soft cloth wetted with it. Rub lightly or allow to stand for a few minutes; then rinse with clear water. If the soil is not completely removed, repeat the procedure or follow with a proprietary cleaner.

Rubber gloves should be used with these solutions and the normal safety and health precautions for handling chlorinated hydrocarbons should be observed. Soil should be removed from the surfaces before parts are joined by welding or soldering in order to produce sound welds and strong soldered joints.

If weld scale is not removed from welds, it may discolor in service and cause rusting in the weld zone areas. It can be removed by chipping or using a stainless steel wire brush.

KENNETH M. HUSTON, author of this article, is a past president of the American Electroplaters' Society, and has long been active in the electroplating industry. He served as co-chairman of the A. E. S. 43rd Annual Convention, held last month in Washington, D. C.

Heat discoloration at welds should be removed for the same reason even though the welds are ground flush. This can be accomplished by an electropolishing method employing alternating current, described in the Armco Fabricating Data Bulletin on Electrolytic Removal of Weld Discoloration.

A frequent cause of corrosion in fabricated stainless steel products is failure to remove soldering flux completely. Discoloration and even severe corrosion will result if the flux remains on the surface.

The flux should be removed immediately after soldering. Otherwise the article may be rusted or discolored before it leaves the shop.

Neutralizing with ammonia or washing soda only converts the acid into salts which are spread over a

greater area. They can cause rusting and pitting. In fact, neutralization is not necessary if the following procedure is used:

Scrub with a platers' brush and plenty of clean water. It is best to use running water. Water from a bucket should be changed frequently to avoid contamination by the flux.

There may be an inclination to regard cleaning in the shop as an unnecessary expense. Failure to properly clean an article before it goes into service may lead to poor performance and sometimes premature failure. The expense of replacing or repairing such articles may exceed the cost of proper cleaning.

"Hereafter, son, check to see if I might be in here cleanin' her up before you turn on the machine, would you please?"

Fig. 3—Effect of passivation on a severely contaminated surface. Left: Passivated before test. Right: Not passivated. Picture was taken after 32 hours in relative humidity cabinet at 122 deg. F. and 100% relative humidity.

Metallic lubricants such as copper, lead or cadmium, applied to stainless steel wire for cold heading, wire drawing or spring winding, are easily removed by immersion in a warm solution of 20 per cent (by volume) nitric acid. This solution is also effective in removing lime and lime-base mixtures used in tumbling and burnishing operations.

Stainless steel wool, with or without pumice, or household cleanser may be used on the fuller finishes, for example, 2B, 2D, or pickled surfaces. It should be remembered that even the finest cleaning powders can scratch or burnish a mill-rolled finish. It is all right to use them on polished finishes, such as No. 4 Polish, but they should be rubbed in the direction of the polish lines.

Thorough rinsing with water and prompt drying are essential to preserve the cleaned finish.

One more cleaning method, that of passivation, will be discussed before proceeding with other types of finishes. It is sometimes required

after final finishing operations, such as scale removal by tumbling, polishing, grinding, sandblasting, machining, forming, drawing, or any other operation which tends to contaminate the surface with particles of imbedded iron. The effect of failing to remove iron after a tumbling operation is illustrated in Fig. 3. The one on the left was passivated, the one on the right was not. Picture was taken after 32 hours in the relative humidity cabinet at 122 deg. F. and 100 per cent relative humidity.

The prime function of the nitric acid-sodium bichromate passivation treatment is to remove the particles of imbedded iron without harming the stainless steel. A second function is the possible reinforcement of the oxide film associated with passivity. However, a properly cleaned stainless steel surface rapidly becomes passive in air and in many other oxidizing environments.

Committee A-10 of the A.S.T.M. has published, "Recommended Practice for Cleaning Stainless Steel," (A380-54T) which includes recommended procedures for passivation. This practice recognizes the fact that a clean piece of stainless steel will air passivate. For this reason it is not necessary to use the nitric acid passivating solution after acid pickling if the pickling operation has been thorough and if the surface has been rinsed well.

Some of you may have experienced flash attack while passivating the free-machining grades of stainless steel, particularly on Type 416. This appears as a gray clouded surface. Armco has conducted several investigations to determine the cause of flash attack. It was found that increasing the bichromate from a normal 2 to 6 per cent in a 20 per cent nitric acid solution will minimize the tendency to flash attack, and extending the time of 15 to 30 minutes to 30 to 45 minutes will dissolve the imbedded iron.

A two or three-minute electropolishing treatment will remove flash attack without significant effect on nominal dimensions.

Parts that have suffered a damaging heat treatment will turn black during passivation. This should not be confused with flash attack.

Grinding, Polishing and Buffing

The same equipment used in grinding, polishing and buffing ordinary steel may be used for stainless steel. Generally, speeds of 6,000 to 8,000 surface feet per minute are

Fig. 4—Rough polishing a weld bead with a 36-grit abrasive belt. (Figs. 3 and 4 courtesy Armco Steel Corp., Middletown, Ohio)

recommended for grinding and polishing, and speeds of 8,000 to 10,000 surface feet per minute for buffing.

In connection with the general subject of polishing and buffing, some of you may have heard that chromic oxide compounds impart better corrosion resistance to stainless steel than can be obtained with aluminum oxide compounds. We conducted an investigation of this by exposing specimens of Types 420 and 304 finished with each type of compound to the severe marine atmosphere at Kure Beach, North Carolina. The results indicated there was no significant difference in corrosion resistance of specimens finished with these compounds.

Stainless steels are easily overheated during grinding, polishing or buffing because of their low thermal conductivity and high abrasion resistance. The operator should not try to overcome the high abrasion resistance by too much pressure on the wheel.

The metal finisher who wants a quality finish will observe these "do's and don'ts:"

Use only stainless steel coloring rouge (green chromic oxide or unfused aluminum oxide) for a mirror finish.

Use only fused aluminum oxide abrasive grain or silicon carbide

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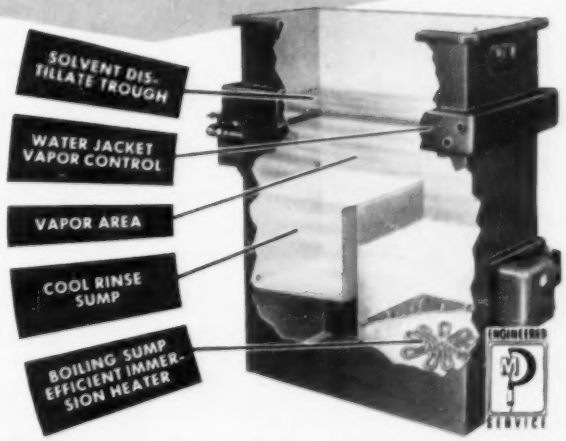

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grain for all grinding or polishing.

Do not clean or polish stainless steel with red rouge, an iron oxide-wax mixture commonly used in polishing other metals.

Do not apply rose tripoli, a soft silica containing some iron oxide.

Do not use turkish emery, a dark natural form of aluminum oxide also known as corundum, which contains a considerable quantity of iron oxide, for final finishing operations. Other hints will be found in the Armco Manual on Surface Finishing, which is available upon request.

Electropolishing

Electropolishing is the reverse of electroplating in that the finish is obtained by electrolytically removing metal from the surface instead of depositing it. It has found wide application on many products, such as refrigerator shelves, sink strainers, bobbin boards, and stove grills, which by their nature would be very costly to polish by any of the mechanical methods.

While there are solutions for electropolishing most base metals, the ones for polishing stainless steel have found greatest commercial application. Of these, the glycolic-sulfuric acid, citric-sulfuric acid, and phosphoric acid-butyl alcohol baths are believed to be most generally used solutions.

These baths, with similar current densities, racking methods and throwing power, are quite like chromium plating baths in their operating characteristics. The essential difference is that the work is the anode in the electropolishing bath.

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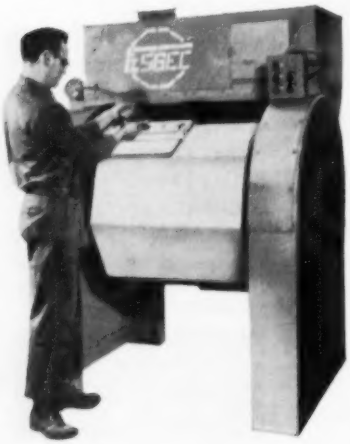

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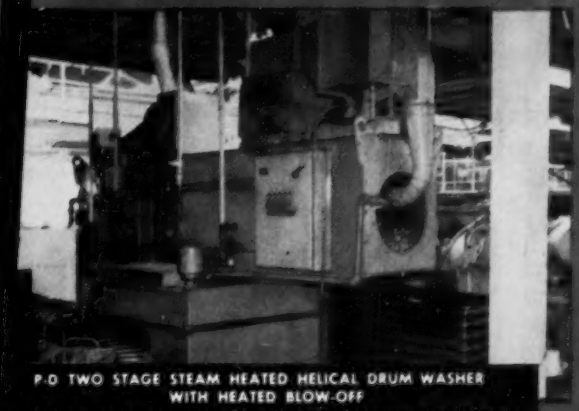

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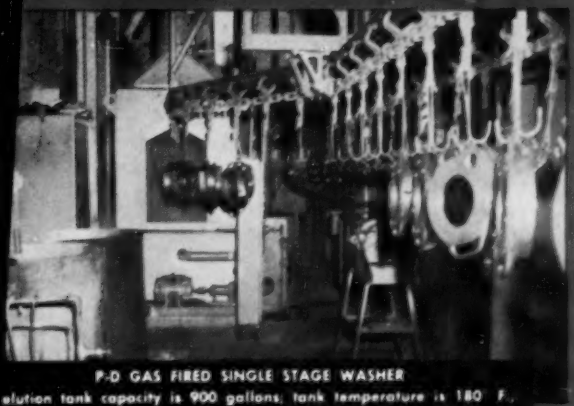
he solution tank capacity is 300 gallons; tank temperature is main-sined at 190° F. and the heated blow-off, 200° F. Up to 50 cubic set of small miscellaneous steel parts are washed clean per hour.



P-D GAS FIRED SINGLE STAGE WASHER

olution tank capacity is 900 gallons; tank temperature is 180° F. leated rinse of 160° to 180° F., room temperature blow-off. This nit is designed to handle miscellaneous machined castings up to 15 lbs. in weight at a rate of 5000 lbs. per hour.

In many cases, plant engineers are faced with serious limitations of available space for the installation of needed additional equipment. Meeting conditions such as these are not the least unusual to Peters-Dalton engineers. The right type washer CAN be designed, fabricated, and INSTALLED by P-D when a layout of plant facilities is given, along with the specifications for the type washer wanted.

The two installations shown here typify P-D efficiency. In the picture at the left the "miser"-like use of space can be readily seen. Here, parts via monorail are brought to and through the washer which is located in a "dead-end" corner of the plant. In the other illustration to the right, the P-D Washer is positioned in an area where it is most accessible for required cleaning operations and for its cycle of productivity.

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square inch will remove approximately 0.0005 to 0.0007 inch of metal from an exposed surface in ten minutes, which is generally sufficient to give a good polish.

These solutions are non-toxic, non-explosive and easy to control. They have long life and require relatively low current densities. The citric-sulfuric and glycolic-sulfuric acid baths operate at 180 to 200 deg. F. and are of the sludging type. They are generally operated in lead-lined, ceramic-lined, or acid-proof brick tanks. Drag-out losses are minimized by the use of a reclaim rinse after electropolishing.

The phosphoric acid-butyl alcohol bath is kept in a stainless steel tank and is run at a lower temperature.

The degree of smoothness resulting from electropolishing depends upon the smoothness of the original surface. A product may require some preliminary mechanical work to remove grinding marks or deep scratches, although a bright finish will be produced by electropolishing even on rough surfaces. The amount of mechanical work varies with the design of the part and the surface condition of the material. Electropolishing will not

Testing For Causes of Rough Deposits?

9. Run a plating [illegible]

By using a testing procedure it will be [illegible] determine chemical adjustment, addition agent control and bath treatment necessary to return the bath to normal plating. Such testing may also indicate the need for greater filtering capacity or for continuous filtering. If filtering is required on a laboratory scale to obtain satisfactory test results then filtering is required to obtain quality production plating.

Filtering Methods

[illegible] method for filtering plating baths with a

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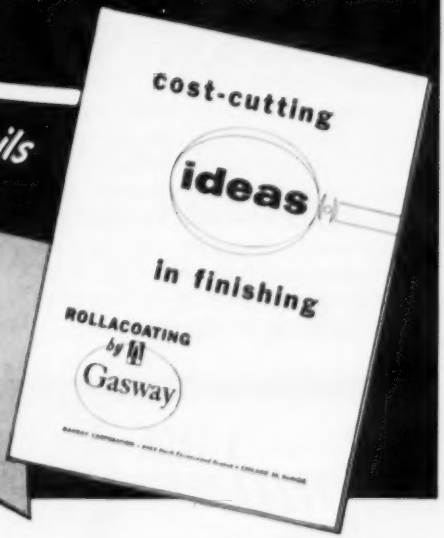

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Metallic lubricants such as lead, copper, or cadmium must be removed before electropolishing. The lead or cadmium coating may not be readily recognized. If the part is a stainless steel coil or spring, a test should be made to determine first whether such a coating is present.

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Some may look upon coloring of stainless steel as "gilding the lily." This is not the case; it has many practical uses. There are applications where the reflectivity of stainless steel is an undesirable quality although its high mechanical properties and corrosion resistance are desirable. Applications on such items as camera components, radio controls, Garand rifles and other military products are typical.

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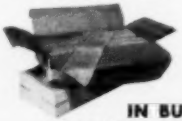

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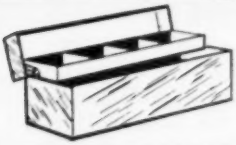

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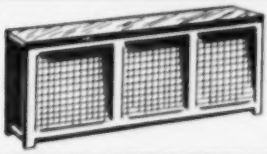

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utes. They are then removed, cooled, rinsed and dried. Immersion in special oils at 120 deg. F. will impart a glossy dark appearance characteristic of most black oxide coatings.

Plating

Various metals are electrodeposited on stainless steel for such purposes as color matching; lubrication during cold heading; coil forming and wire drawing processes; prevention of galling; staving off superficial rusting where appearance is important; improvement of wetability (as in fountain pen nibs); improvement of heat and electrical conductance; and jewelry decoration.

Any standard coating may be electrodeposited directly on any grade of stainless steel after the surface has been properly cleaned and activated. The procedures in the "A.S.T.M. Recommended Practice for the Preparation of and Electroplating on Stainless Steel," (No. B254-53) are adequate.

This article is intended to inform metal finishers of factors to be considered in finishing stainless steel. It is impractical to review here all the conditions affected by grades, heat treatments, mill finishes and fabrication procedures. Specific problems should be referred to the stainless steel supplier for details regarding the proper finishing procedure. This should be done in the planning stage.

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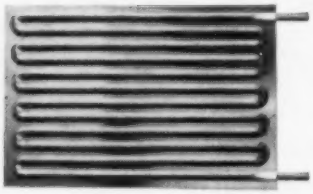

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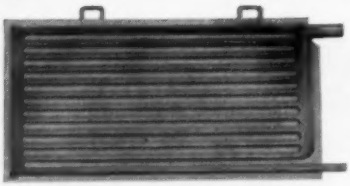

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Water Reducible Coatings

Tests show promise for this type coating, particularly as a primer. Biggest advantage: non-flammability.

By GEROULD ALLYN
Rohm & Haas Company
Philadelphia, Pa.

ON AUGUST 12, 1953, A SPARK from a welder's torch set fire to oil in the General Motors hydramatic transmission plant at Livonia, Mich. The resulting blaze destroyed the building and took two lives.

"Well, now, aren't we the neat one, hmm?"

On that day, interest in water-reduced coatings for industrial finishing reached a new peak. For although paints did not cause the fire, they contributed to it by adding a source of flammable material.

Besides the advantages in reduction of fire hazard when flammable solvents are replaced by water, this type of paint has other features worthy of consideration: Solvent odor is eliminated, and there are no fumes to be controlled. Water is cheap and readily available. Furthermore, in the automobile industry particularly, wet sanding is commonplace and paints that would adhere to a damp surface would permit faster production and eliminate one drying step.

There are three types of water based systems that have been studied in relation to the industrial finishing field. These are the water-soluble heat-hardening phenolic system, the alkyd-nitrogen resin emulsion system, and the acrylic emulsion system. This paper concerns the acrylic emulsion system.

Extensive studies have been made in our laboratories of primers for

automotive applications based on acrylic emulsions. There were several reasons for selecting the acrylic emulsions for this study. The acrylic emulsions yield tough adherent films with excellent resistance to cutting and lubricating oils and to outdoor weathering. No plasticizers are needed, as the films are very flexible. This prevents plasticizer migration and plasticizer loss. The films dry quickly by evaporation of the water and form films at low temperatures.

Much experimental work on acrylic emulsion finishes is being directed toward the production of a successful red oxide primer for automotive use. The outlook for the development of gloss topcoats is not too encouraging, at least with polymers presently available.

Testing Acrylic Automotive Primer Sealers

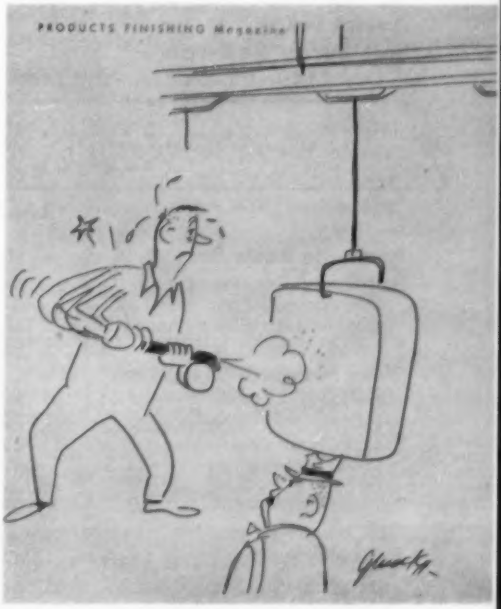
In the evaluation program conducted in the laboratory, a standard commercial oil-based auto body primer was used as the control. Test work was conducted by spraying one coat of primer on phosphatized automotive sheet steel panels. An alkyd-melamine baking enamel was used for the topcoat. Test results are shown in Table I.

Sanding Properties

Panels were wet sanded with No. 400 paper. The higher pigment ratios gave somewhat easier sanding properties, as might be expected. Formulation A, with 20 per cent talc at 70:30 pigment:binder ratio gave excellent sanding properties.

Enamel Hold-Out and Gloss

This property was tested by topcoating with a blue automotive enamel and measuring 60 degree gloss. Gloss values obtained were 86 per cent for the 70:30 formulation; 87 per cent for the 60:40 and 87.5 per cent for a commercial control. Differences were slight, and not significant, all showing excellent hold-out.



"You ruin 3 guns in a row—whatcha expect?"

Hardness and Adhesion

All of the acrylic primers were somewhat softer than the commercial control primer as measured by a knife test, but this may provide better adhesion and impact resistance. Formulation A gave the best hardness of the acrylic primers. Adhesion and flexibility of this primer were rated excellent.

Baking Schedules

The temperature at which the film is baked has an effect on the properties of the system. A film baked for 30 minutes at 300 deg. F. gives better adhesion than one baked at 250 deg. F. Best adhesion was obtained when panels were placed in the oven immediately after spraying, although a very good adhesion is also obtained when the primer is air dried, topcoated, and then the whole system baked.

Salt Spray Resistance

One of the most interesting properties of these systems is the good salt spray resistance which can be obtained. The primer films, either alone or topcoated, and using a scored panel, will withstand 500 hours of salt spray with only slight blistering and undercutting. Formulation A was very close in salt spray resistance to an oil-based commercial primer. Interestingly enough, undercutting at the scratch marks with topcoated acrylic primers occurred between the topcoat and the undercoat, while the commercial primer undercut at the metal.

Water Immersion Resistance

Topcoated panels were tested by immersing in distilled water at 100 deg. F. for 250 hours. Formulation B with 20 per cent acicular zinc oxide gave best results in the acrylic primer series. Zinc oxide seems essential in these systems if good water resistance is to be obtained. None of the acrylic systems showed rusting,

Table I
PROPERTIES OF ACRYLIC EMULSION AUTOMOTIVE PRIMERS
(Films Baked 30 minutes at 300 deg. F.)

Property	Acrylic Primer A	Acrylic Primer B	Acrylic Primer C	Commercial Oil-Based Primer
Pigment to Binder Ratio	70:30	70:30	60:40	——
Salt Spray Resistance (500 hours, 20 per cent salt solution-primer and topcoat)	1st	3rd 1/8 inch undercut	1st	2nd 1/8 inch undercut
Water Immersion Resistance (100 deg. F.—250 hours—primer and topcoat)	Intense blistering and wrinkling	Not affected	Very slight blistering	Scattered small blistering, rusting
Freeze-Thaw Resistance (Five cycles at plus 15 deg. F. to room temp.)	Slight flocculation	Failed	Flocculated	——
Adhesion (knife)	Excellent	Very good	Very good	Excellent Hardest film in series
Flexibility (inch pounds—primer and topcoat)	22	22	——	18

Table II

PROPERTIES OF ACRYLIC EMULSION WHITE APPLIANCE PRIMERS

Property	Acrylic Primer E	Acrylic Primer F	Acrylic Primer 141	White Alkyd Primer
Baking Schedule	35 min @ 300 deg. F.	35 min @ 300 deg. F.	35 min @ 300 deg. F.	35 min @ 250 deg. F.
Dry Sanding Properties	Sl. poorer	Sl. poorer	Sl. poorer	Best
Wet Sanding Properties	Equal	Equal	Equal	Equal
Whiteness	Best	Best	Best	Fair
Pencil Hardness	2H	3H	2H	2H
Salt Spray Resistance (816 hrs., 20% salt solution—95 deg. F., Navy scale—10 best)	6.0	4.7	5.7	2.7
Immersion Resistance (720 hours distilled water—100 deg. F.)				
Blistering	2	2	2	10
Corrosion	7	7	9	9

but rust was visible in the commercial control system.

Freeze-Thaw Resistance

Unfortunately, Formulation B with zinc oxide, which looks so good in the salt spray resistance tests, does not have resistance to freezing. Formulation A withstood five freeze-thaw cycles with only slight flocculation evident.

Lacquer Lifting

A black nitrocellulose lacquer applied as a topcoat to the baked acrylic primers and the commercial primer showed no evidence of lifting.

Thermoplasticity

Pigment content controls the extent of print resistance in these formulations. None of the primers printed when tested at 150 deg. F. for one hour with a load of 100 grams per square inch. With two pounds pressure at 150 deg. F., heavy printing was obtained with the 60:40 pigment ratio, and definite to light printing with the 70:30 formulations. The commercial control showed light printing.

Summary of Automotive Primer Study

More work remains to be done on these systems, but excellent progress has been made. Particularly interesting are the properties of salt spray resistance, easy sanding, good hold-out, excellent adhesion and toughness obtained in systems of this type. Since water is present to the extent of 40 per cent by weight, and any thinning is done with water, the paint is substantially non-flammable before application.

White Appliance Primers

The other type acrylic emulsion primer studied in our laboratories is a white appliance type primer for use on refrigerators, kitchen cabinets, and similar equipment. Present formulations have properties quite comparable to alkyd systems in most respects. They have good spraying properties, can be wet sanded, and have excellent hardness, flexibility, adhesion, enamel hold-out, color retention, impact resistance, humidity and salt spray resistance.

However, the primers do not have very good resistance to blistering when immersed in soap solution, detergent solution or hot water. This would eliminate present formulations as washing machine primers.

Test Conditions

Primers were tested by spraying one coat over phosphatized steel panels at 0.8 mils dry film thickness. Primer coats were tested for resistance properties both alone and topcoated with a baking enamel with vehicle consisting of 70 per cent nonoxidizing alkyd and 30 per cent melamine resin.

Comparisons were also made with a conventional white alkyd primer.

Test Results

A summary of test results on these white primer systems is given in Table II. Table III lists test results on the systems consisting of acrylic primers and alkyd-melamine baked top coats.

As can be seen from the data in Tables II and III, the properties of the acrylic emulsion primers based on "Rhoplex" AC-33 are quite comparable in many respects to those obtained with the alkyd primer. Resistance to salt spray and impact were better and films were whiter. Ease of wet sanding, hardness, corrosion resistance, adhesion and enamel hold-out properties were almost identical. However, the emulsion systems were poorer in resistance to blistering during water immersion, and showed slightly inferior dry sanding properties. None of the emulsion systems would withstand one freeze-thaw cycle.

Table III
PROPERTIES OF TWO-COAT SYSTEMS—WHITE APPLIANCE PRIMERS TOPCOATED WITH BAKED ALKYD-MELAMINE COAT

Property	Acrylic Primer E	Acrylic Primer F	Acrylic Primer Formulation 141	White Alkyd Primer
Pencil Hardness	4H	4H	4H	4H
Photovolt Whiteness (low values best)	6.09	5.64	7.92	9.20
Impact Resistance (inch/lbs.)	16	20	18	16
60 deg. Gloss	81.8	79.8	80.9	81.3
Adhesion	Equal	Equal	Equal	Equal
Salt Spray Resistance (Resistance to stripping with cellophane tape—864 hours—20% salt—95 deg. F.—inches removed)	0.50	0.87	0.83	0.60
Immersion Resistance (960 hours distilled water—100 deg. F.)				
Resistance to blistering				
Blister evidence	5	8	8	10
Blister size	4	5	4	10
Corrosion resistance	8	10	10	10
60 deg. Gloss	75.0	79.0	75.5	81.0

Summary

Satisfactory white emulsion primers can be made using an acrylic emulsion as the vehicle. Such primers have many of the properties of conventional alkyd primers, with the major exception of being inferior in resistance to water immersion. The emulsion primers have the definite advantage of being substantially non-flammable prior to application, and this would reduce the hazards in storing and application.

Conclusions

In conclusion, it may be stated that practical water-reducible industrial primers for automotive and appliance use can be made with Rhoplex AC-33 acrylic emulsion. These industrial finishes are substantially non-flammable in liquid form, since they do not use flammable solvents as reducers.

ACKNOWLEDGMENT

This paper is based on laboratory work by Dr. W. C. Prentiss, L. Wetzel, and Mrs. A. Davis Carmen, of the Rohm & Haas Company, Research Division.

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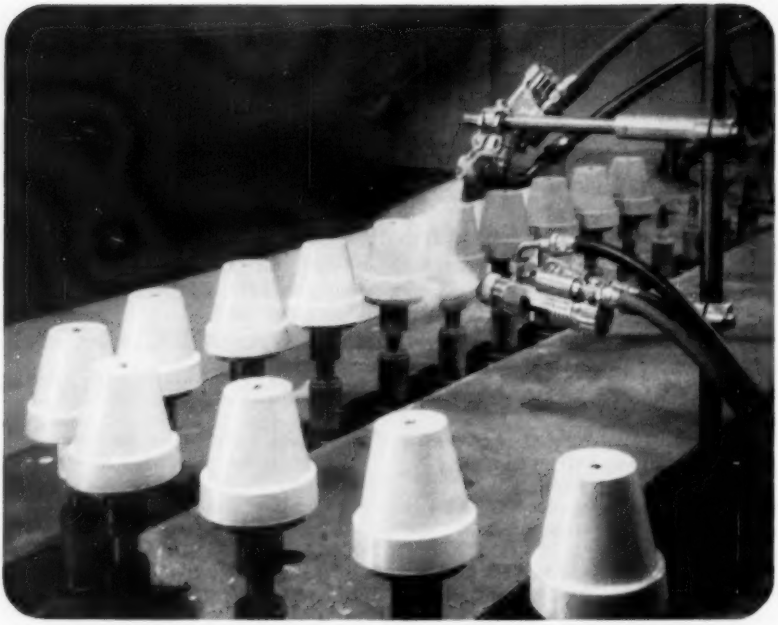
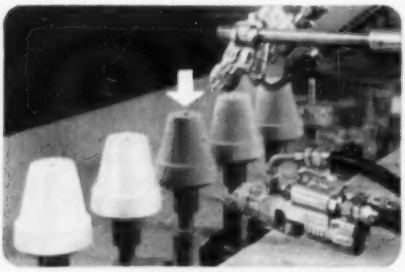
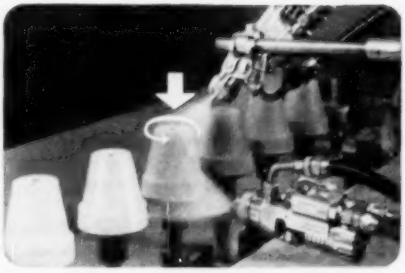


1 DeVilbiss automatic applies a flawless, uniform finish to flower pots at the rate of 3600 an hour. Spray cycle is synchronized with conveyor travel.



2 With spindles six inches apart, chain-on-edge conveyor moves pots into position.



3 At precise instant, two guns spray with overlapping patterns; pot revolves three times.

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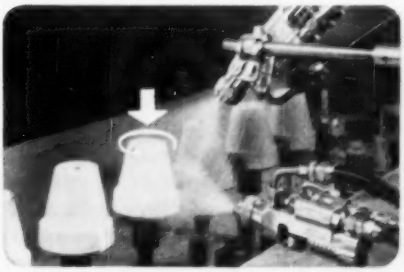
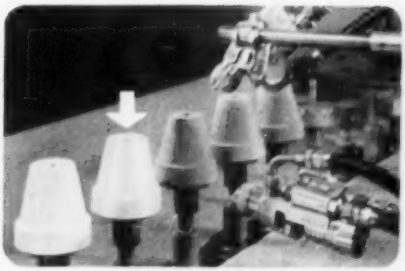


4 Painting takes one-half second. If spindle is empty, machine skips it; guns don't spray.



5 Finished pot moves as next one takes position. Total cycle only lasts one second.

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Fig. 1—Electroformed mold for a nylon gear wheel. Process produces exact tolerances.

Producing Molds

By W. J. B. STOKES II
President, Electromold Corporation

WHEN METAL IS ELECTRODEPOSITED for a sufficient length of time to form a structure that stands alone, the process is called electroforming.

The idea of making molds by electroforming is almost as old as electroplating itself, one patent for electroplating molds dating back to 1899. Old methods for electroforming usually use copper as the main electroforming metal, wax or graphite as the material for the master, and coating with graphite or metal powder as a means of making the master conductive.

With the growth of plastics molding and metal pressure die casting industries, the incentive to make molds commercially by electroforming has increased. The London & Scandinavian Metallurgical Co. commenced its development work in this field in 1941. A hard nickel alloy was used as the electroforming medium, applied to precision machined masters as the basis. A microscopically thin metallic silver coating was formed on the master to produce a good conducting surface upon which to plate.

One problem which had to be solved was that of backing the electroformed shells. Casting type metal behind the shells, as proposed in the old literature on the subject, would not strengthen the shells enough for the uses to which the molds would be put. Casting of steel behind the molds was abandoned because of thermal problems inherent in this method, and spraying of metal from a gun as a means of backing was also found to have certain disadvantages, such as stress and softness. The method finally adopted consists of electroforming the mold skin in hard nickel, and then backing this initial skin or shell by electroplating with copper until the dies are built up completely by electroplating.

The United States licensee for this patented process developed in England is the Electromold Corporation, 140 Enterprise Ave., Trenton 2, N. J.

The economic basis for making electroformed dies lies in the manufacture of the master. For many shapes it is cheaper to make and

y Electroplating Methods

check dimensionally a positive master rather than cut a corresponding cavity into steel.

When making a non-metallic master for electroforming a die cavity, there is also the advantage of easy machinability (and the possibility of using lighter machine tools) apart from the convenience of being able to build up complicated sections by cementing together sub-sections.

The choice of master material is important. The material should preferably be non-metallic, easily machinable, reliably cemented by adhesives, and dimensionally stable under slightly elevated temperatures and in contact with plating solutions. It should also be easily removable from the finished shell.

The material found to meet most nearly all the specifications is acrylic resin, although other plastics are used. Metal masters are used when very close tolerances are to be held.

If a plastic master is to be used, its surface must first be made electrically conductive, so that metal may be electrodeposited upon it to form the shell. This is done by spraying the mold simultaneously with two solutions (one being a silver coating solution and the other a reducing solution) from a gun with twin jets. These solutions react to form a microscopically thin coating over the plastic. This coating is so thin that it does not affect the accuracy of the future die.

After the initial metallization, electroforming in the nickel bath is carried out. Substantial amounts of research have been carried out by

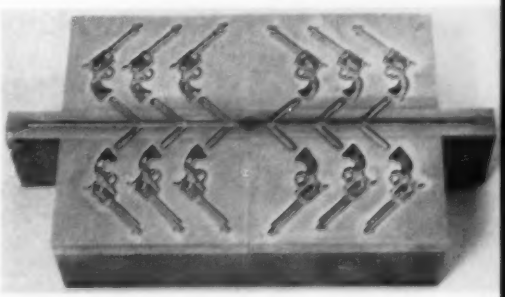

Fig. 2—Useful technique in electroforming is shown by this mold, in which cavities are made close together in one block, thus making molding of small pieces more economical.

London & Scandinavian Metallurgical Co. in connection with the nickel plating stage. Patents are now being taken out on recently developed improvements in the process.

One technical problem involved in electroforming molds is to produce an evenly thick, stress-free metal.

The second problem concerns ductility—the avoidance of brittleness while still maintaining hardness. Organic stress reducers used in some nickel plating solutions have a tendency to make nickel brittle, particularly after the nickel has been exposed to such comparatively low temperatures as are used in compression molding.

The third problem concerns the production of shells of uniform cross-section and deposit thickness. The development mentioned above has brought about production of shells which are substantially uniform due to the very high throwing power of the baths used.

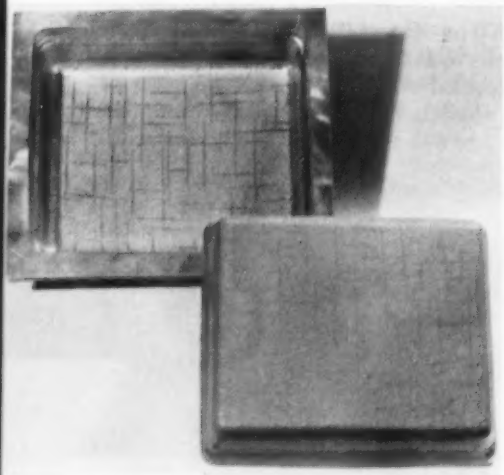

Fig. 3—Example of a surface texture mold produced by electroforming, and the plastic product molded from it (lower right). (Photos courtesy Electromold Corp., Trenton, N. J.)

At present the average thickness of the nickel shell is 5/32 inch. Measured by a Vickers diamond micro hardness tester with a 200 gram weight, the hardnesses obtained on the die face vary between 400 and 470 Vickers (41-46 Rockwell C.) With every batch of masters, test pieces are hung in the bath and these are used for checking the hardness and ductility. This is done by a bending test. The ductility obtained under present conditions is such that pieces can be bent sharply through 90 degrees.

With the master still inside, the nickel shells are transferred to the copper back-up baths. Both in the nickel and copper stages, excessive build-up of metal on the base is prevented, so that the master may be extracted more easily.

The copper backing is carried out in a special alkaline bath by the periodic reverse process, but operated in a novel way to obtain rapid filling in of the deep recesses under stress-free conditions. One of the effects of periodic reverse plating, particularly under the conditions mentioned here, is that the metal structure is refined while being deposited. This explains the hardnesses of between 200 and 250 Vickers obtained while in the copper backing process.

After the completion of the copper plating, shells are cut open and the master removed by heating. Later the silver transferred from the master is chemically removed to prevent tarnishing. Very little polishing of the mold is necessary.

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For more data circle **165** on Reader Service Card

Special Reports On Finishing Non-Ferrous Metals

NUMBER III—Lustrous, Corrosion-Resistant Finishing with Chemical Polishing Iridite®

WHAT IS IRIDITE®?

Briefly, Iridite is the tradename for a specialized line of chromate conversion finishes. They are generally applied by dip, some by brush or spray, at or near room temperature, with automatic equipment or manual finishing facilities. During application, a chemical reaction occurs that produces a thin (.00002" max.) gel-like, complex chromate film of a non-porous nature on the surface of the metal. This film is an integral part of the metal itself, thus cannot flake, chip or peel. No special equipment, exhaust systems or specially trained personnel are required.

Chromate conversion coatings are widely accepted throughout industry as an economical means of providing corrosion protection, a good base for paint and decorative finishes for non-ferrous metals. Certain of these coatings also possess chemical polishing abilities that have luster-producing, as well as corrosion-inhibiting, effects on zinc and cadmium plate, zinc die castings and copper alloys. However, continued developments in this field have been so rapid that many manufacturers may not be completely aware of the breadth of application of this type of finish. Hence, this discussion of the many ways in which this chemical polishing characteristic can be used in final finishing or pre-plating treatments to produce a lustrous appearance with distinct display and sales appeal and appreciable savings in cost. Report I on decorative, corrosion-resistant finishes and Report II on paint base, corrosion-resistant finishes are available on request.

The degree of luster possible on a surface is a function of the degree to which the surface can be smoothed. Leveling to provide a smooth surface can be achieved by mechanical or chemical means, or a combination of these, depending upon the luster desired and the original condition of the metal. Chemical polishing effectively imparts luster otherwise difficult and costly to obtain. For this reason, it is often used to supplement or entirely replace mechanical polishing, depending upon the application and the original condition of the metal. Chemical polishing has the additional advantage of providing overall treatment of the submerged part. It reaches into even the deepest corners and recesses that are otherwise inaccessible. Certain of the Iridites are specifically designed to perform this chemical polishing operation. In addition they provide corrosion protection as do all Iridites, thus may be used either as a final finish or a pre-plating polish.

If Iridite is to be used as a final finish, in contrast to pre-plating treatment, the

(Advertisement)

chromate conversion coating generated is allowed to remain, providing good corrosion resistance. Color inherent in these Iridite films ranges from a yellow cast to yellow iridescent. These coatings may be used without further treatment where this color is acceptable and good corrosion resistance is desired. Further, these basic coatings can be tinted by dyeing. Among the dye tints available are shades of red, yellow, blue and green. If desirable, the basic coatings can also be modified by a bleach dip leaving a clear bright or blue iridescent finish. In all cases bleaching reduces corrosion resistance.

As examples of this type of final finishing, Iridites #4-73 and #4-75 (Cast-Zinc-Brite) make possible for the first time, lustrous chemical polishing of the as-cast surface of zinc die castings. Thus, in many cases, sizeable savings in finishing cost are realized by elimination of plating costs. This economical method can be used on tools, appliance parts, toy pistols, locks and many other small castings. Another example is the treatment of copper and brass parts, such as welding tips, to eliminate buffing and provide additional corrosion resistance. In many cases, handling costs are reduced appreciably by replacing piece-part handling with bulk processing. Still another example of the use of this chemical polishing and protective quality of Iridite is a simple system of zinc plate, Iridite and clear lacquer instead of more costly electroplated finishes. Typical of this type of lustrous finish are builders hardware and wire goods.

As a pre-plating treatment, in contrast to final finishes, Iridite can be used to chemically polish zinc die castings or copper prior to plating. In such cases, Iridite should be applied as an in-process step, so that the protective film is removed before the plating cycle. The savings in handling, material and labor costs are obvious. This process has made it practical to plate chrome directly over copper on steel, conserving nickel, yet producing a lustrous chrome finish. Used after stripping faulty plate in reprocessing zinc die castings, Iridite restores luster to the casting, making possible replating without blistering.

Other Iridite finishes are available to produce maximum corrosion resistance, a wide variety of decorative finishes and excellent bases for paint on all commercial forms of the more commonly used non-ferrous metals. As a final finish, appearance ranges from clear bright to olive drab and brown and many films can be bleached or dyed. As a paint base Iridite provides excellent initial and retentive paint adhesion and a self-healing property which protects bare metal if exposed by scratching. Iridites have low electrical resistance. Some can be soldered and welded. The Iridite film itself does not affect the dimensional stability of close tolerance parts.

Iridites are widely approved under both Armed Services and industrial specifications because of performance, low cost and savings of materials and equipment.

You can see then, that with the many factors to be considered, selection of the Iridite best suited to your product demands the services of a specialist. That's why Allied maintains a staff of competent Field Engineers—to help you select the Iridite to make your installation most efficient in improving the quality of your product. You'll find your Allied Field Engineer listed under "Plating Supplies" in your classified telephone book. Or, write direct and tell us your problem. Complete literature and data, as well as sample part processing, is available. Allied Research Products, Inc., 4004-06 East Monument Street, Baltimore 5, Maryland.

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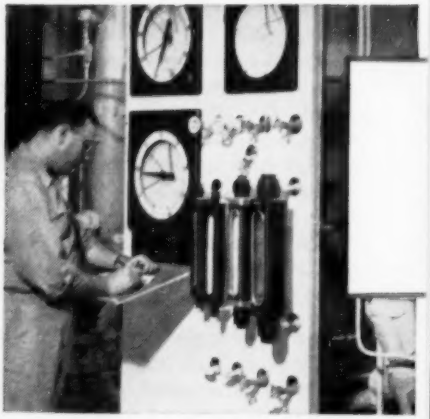
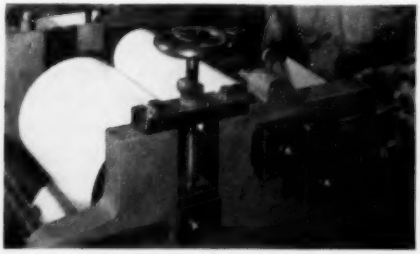
Add the Experience and

● **Synthesis** of a new compound is one of the first steps in developing a new type of surface coating.



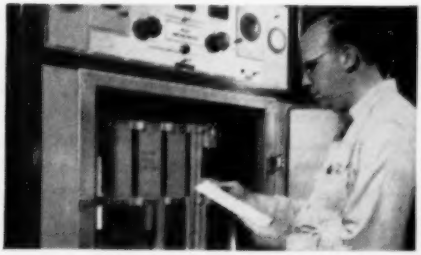
● **New resins** used in formulations for coatings are made in a pilot plant to provide quantities for field evaluation.

● **Special coatings** are formulated using new resins on a ball mill.



● **New coatings** are then applied to special surfaces with roller coater.

● **Gloss** of new experimental finish is carefully tested for durability.



● **In this equipment** accelerated weather conditions are created to test finishes.

Skill of Pittsburgh's

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to your finishing staff . . . without increasing your payroll!

Paint industry's most modern research facilities are at your service to provide you with specialized coatings for your needs.

DO YOU NEED better finishes for the products you are making today? Better finishes for tomorrow's products? Finishes with finer appearance, longer-lasting gloss and color, greater adhesion, more stubborn resistance to stains, grease, moisture, salt, alkalis and acids?

● **If you do . . .** then add the superior skill and knowledge of Pittsburgh's Finishes Technologists to your staff, without increasing your costs. In its new Paint Research Center at Springdale, Pa., Pittsburgh offers you the most modern facilities for fundamental and applied research in the paint industry. Here a highly-trained staff of chemists, engineers and technicians, working with new materials, processes and application methods maintains Pittsburgh's traditional leadership in the field of surface coatings.

● **This manpower** and these facilities are available to help you get better finishes from existing materials or from new chemical compositions and to devise more efficient ways to apply these coatings. Why not make use of these technologists on your problems? Write, wire or call Pittsburgh Plate Glass Company, Industrial Finishes Division, 1 Gateway Center, Pittsburgh, Pa.

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finishing clinic

Suggested solutions to problems submitted by readers. Send your problem to our Editorial Staff. There is no charge.

Filling Seams

Question: *We have been looking for a filler used in filling seams on sheet metal parts before painting. This filler should conform to the following specifications:*

1. Application of filler must be smooth and uniform with negligible amount of shrinkage after hardening.

2. Positive adhesion to metal.

3. Its texture must be such that it will remain pliable for at least three minutes and air dry within one hour to permit sanding to a feather edge.

4. Filler shall not distort, crumble or become brittle after baking on of enamels at 400 deg. F. oven temperature, and shall not be visible through enamel.

5. If possible, filler should be applicable on a painted surface as well as unpainted metal.

6. Filler shall not contain ingredients injurious to health or cause dermatitis of the skin.

We would be very much obliged if you could refer us to a source that could furnish us a filler as described above.

H. B. O.

Answer: We are referring you to sources for fillers and feel certain that the companies can either recommend a specific product or manufacture one to your specifications.

Enameling Die Castings

Question: *We have so far been unable to get good adhesion of synthetic enamels to our zinc-aluminum die castings without the use of a phosphoric acid etching agent prior to the application of the enamel.*

Can you suggest any means whereby we might eliminate this etching operation and apply the enamel directly to the cleaned die casting? We would prefer not to use a primer.

C. L. F.

Answer: It is standard practice in the finishing industry to use some kind of treatment prior to the application of paint, lacquer, or enamel to die castings. The nature of the metal is such that it is difficult to get proper paint adhesion without some sort of treatment before painting.

Generally, treatments consist of a phosphatizing process such as you have been using, or a chromate dip which you might like to investigate. Chromate dips are supplied by a number of companies whose names we are forwarding to you.

In the preparation of metal for painting, it is sometimes feasible to combine cleaning and phosphatizing in one operation. We are referring you to a number of companies for further information on this process.

Rust Preventive

Question: *I am presently searching for a rust inhibiting material into which I could immerse iron castings. My aim is to provide rust protection on the internal parts of the casting. The outer surfaces of the casting will be protected by paint. I have tried several different types of anti-rust preparations, but I have not been able to locate anything over which I could apply the black lacquer that I am now using. This, of course, is due to the fact that the preparations have been of an oily nature which prevents proper adherence of the paint. Cleaning or masking of the outer sections of the casting is impractical. Therefore, I am searching for a preparation that will dry on the inner and outer surfaces without depositing an oil film.*

W. H. W.

Answer: Thank you for your letter outlining your problem in obtaining a rust inhibiting material for use on iron castings. We are referring you to a number of companies who will be able to recommend products for the purpose mentioned.

★ ★ ★

Copper Anode Polarization

Question: *We would appreciate your assistance in solving two problems, one of plating and one anodizing.*

We are operating a Rochelle type copper, and we frequently have difficulty with anode polarization. We are not encountering poor or rough deposits, but we are failing to achieve the necessary anode corrosion; in addition thereto, the anodes appear most unsightly due to the dark film formed.

Occasionally, especially during hot, humid weather, we encounter "tacky or sticky" anodic films more often on black anodized parts. The parts are anodized in a sulfuric acid electrolyte 18 per cent by weight H_2SO_4. The solution temperature is held at 68 to 74 deg. F. After anodizing, parts are subsequently dyed black and thereafter sealed in a solution containing 5 g/l nickel acetate; the parts are then dried in an oven at 240 deg. F.

V. F. S.

Answer: Anode polarization in the copper solution may occur from a number of causes, but the one which is encountered more frequently is that of too low a free cyanide content in the solution. We are referring you to sources of further information on this subject.

The formation of a "tacky or sticky" film on black anodized parts sealed in a solution containing nickel acetate suggests a possibility that an acetate film remains on the surface after sealing and drying. Perhaps a more thorough rinsing or the use of a low concentration of nickel acetate in the sealing solution will eliminate this undesirable condition.

★ ★ ★

Removing Silver Tarnish

Question: *I wonder if you could recommend a source who could furnish us with a compound for removal of the tarnish from silver by merely dipping the silver piece in this preparation.*

C. M. S.

Answer: If you have silver plating facilities available, it might be possible to remove this tarnish in the sodium cyanide solution used as a dip prior to silver plating. It may also be possible to remove the tarnish by suspending the article in a silver plating solution and applying reverse current—with the tarnished article as the anode.

For information regarding chemical compounds which would be helpful in removing the tarnish, we are forwarding the names of several manufacturers.

Finishing Clinic

Finish on Aluminum

Question: *One of our foreign stockholders who manufactures, among other items, aluminum pressure cookers, has written to us requesting technical information to improve the polish of their product.*

They are interested in obtaining some paste, powder, or other types of abrasives to perfect the finish on their product. If there are any special processes in use by manufacturers of aluminum ware in this country, they would be interested in obtaining literature and technical information on these processes.

G. E. A.

Answer: The problem of obtaining a finish on aluminum is one of selecting the proper cloth buffs and buffing compounds. We are referring you to several companies who supply both buffs and compounds and are qualified to advise concerning the proper products to use in producing various types of finishes on aluminum. These companies can supply literature, technical information, and recommendations.

★ ★ ★

Polishing and Buffing Titanium

Question: *Please send us information or literature, or advise where it may be obtained, on polishing and buffing titanium.*

We are interested in what grit size belts to use and the kind of compound to use for good finish.

We are having trouble with material pulling in buffing operation, and our belts fill up very fast during polishing.

H. L. C.

Answer: For information regarding polishing belts and polishing compounds for use on titanium, we should like to refer you to several companies for recommendations.

You may be interested in having the enclosed tear sheet of the article, "Comments on the Finishing of Titanium," published in the March 1953 issue of PRODUCTS FINISHING.

★ ★ ★

Cleaning

Question: *Please send us names of companies that manufacture ultrasonic cleaning equipment. Also, if possible, any literature and/or information you might have on this type cleaning—particularly, in the cleaning or removing of lead, oxide, and other foreign substances from stainless steel parts.*

We would appreciate any information on other types of chemical cleaning available.

A. B. F.

Answer: Manufacturers of ultrasonic cleaning equipment are listed in the 1956 PRODUCTS FINISHING Directory under the classification, "Cleaning Equipment, Ultrasonic." These companies provide sales literature on their products and processes. As you are well aware, the best information regarding a chemical process may be gained by a demonstration. It is quite possible that some of these companies may have a unit operating in your area to which they could direct you.

Companies manufacturing other types of cleaners are listed in the PRODUCTS FINISHING Directory under the heading, "Cleaners, alkali, emulsion." In the case of the cleaning of stainless steel, the cleaning may be a pickling process and, therefore, you might find the companies listed under "Pickling Processes and/or Solutions" to be of interest.

For more data on advertisement on opposite page circle 168 on Reader Service Card ——→

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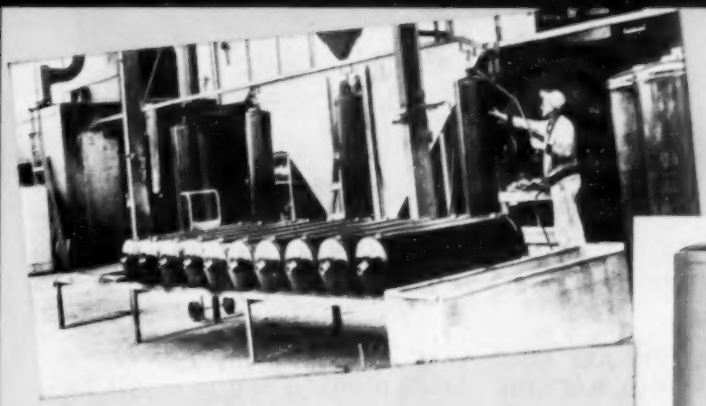

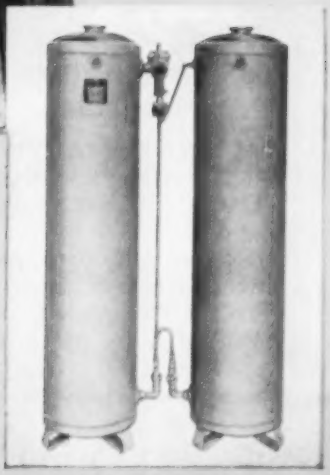

Plastic coating guards water softener tanks against corrosion

HERE'S HOW...

The Roper Manufacturing Corporation of El Monte, California, needed a tough, dependable anti-corrosion lining for tanks used in water treatment. They decided to test a promising coating formulated from Epon 1007 and supplied by the Trail Chemical Company of El Monte.

This Epon resin-based coating, applied to steel panels, easily survived severe tests for metal adhesion and thermal shock. Immersion tests showed that it resisted organic chlorides, detergents, salt spray and acids at both room and elevated temperatures.

Finally, two test panels were taken from an autoclave in which they had been held for two years. The first panel—coated with a high-quality porcelain—showed large rust spots, while the Epon resin-based coating on the other panel *was still intact*. Small wonder that Roper has now standardized on Epon resin-based coatings to line their water softener tanks. More than 30,000 tanks have been delivered, with no complaints to date.

If you have a product finishing problem, consider solving it with Epon resin-based coatings. They have excellent adhesion, resistance to abrasion and impact, plus the ability to withstand heat, humidity and the attack of corrosives. You can call on our sales offices for the names of Epon resin-based coating formulators. Write for your copy of "Planning to Paint a Pyramid?"

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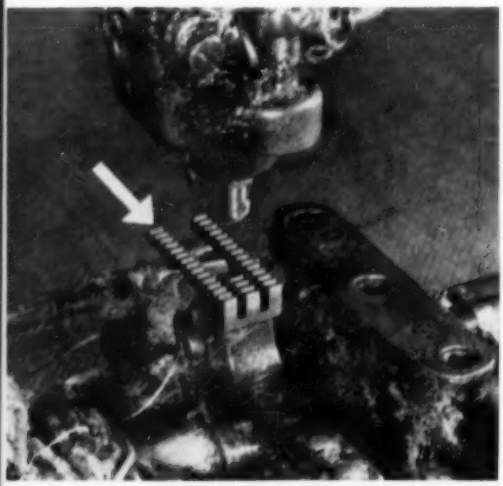
SHELL

Flame Plating Sewing Machine Feed Dogs

Unique process provides tungsten carbide coating on metal parts to increase service life.

FACTORY OPERATORS ARE CUTTING THEIR SEWING MACHINE FEED DOG COSTS by as much as 70 per cent through the use of standard steel feed dogs flame-plated with a thin coating of tungsten carbide. The tungsten carbide coatings, applied by Linde Air Products Company's Flame-Plating process in Linde plants, is said to extend the service life of standard steel feed dogs to as much as six times that of uncoated parts. Extensive tests by a leading sewing machine user have shown that steel feed dogs have an average life of about one month when used on highly abrasive materials such as burlap or canvas. Flame-Plated feed dogs, however, have given as much as six months' service on the same materials.



The feed dog in this industrial sewing machine (cover plate removed) has been flame-plated with tungsten carbide. The hard, wear-resistant coating is said to extend the service life of this part at least six times.

Flame-Plating is a unique process developed by Linde Air Products Company, a Division of Union Carbide and Carbon Corporation, 30 E. 42nd St., New York 17, N. Y., for depositing a tungsten carbide coating on metal parts. Because the temperature of the base metal does not exceed 400 deg. F. during coating, finished or semi-finished parts can be coated without danger of dimensional or metallurgical change. The Flame-Plated coating may be left in as-coated condition (about 125 microinches r.m.s.), as in the case of the sewing machine feed dogs described above, or the Flame-Plated coating finished to 1 to 5 microinches r.m.s. for precise applications.

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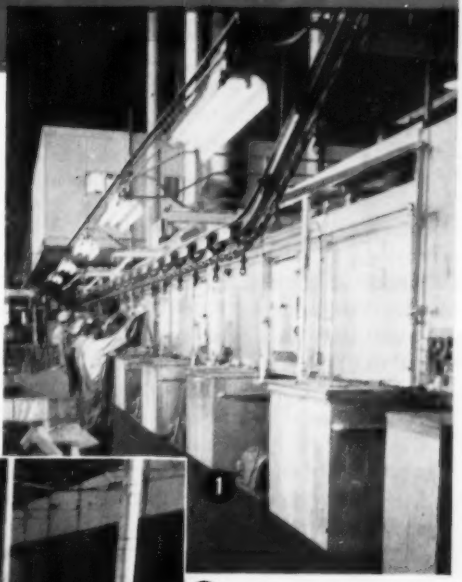
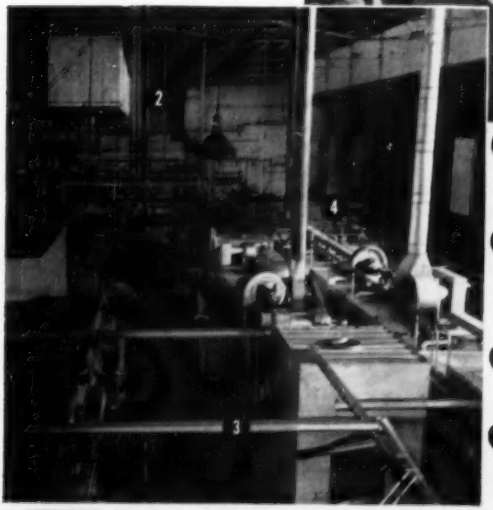
states C. W. Onan, of Minneapolis

Mr. Onan's reference was to their new Burdett-Engineered Paint Room Modernization Program.

This could well be your statement too, if you could reduce your payroll from 50 to 35 men, yet produce more with improved quality of finish. Comparable savings and increased production can be made in your plant with a Burdett System engineered to your requirements. There are no obligations for Burdett recommendations — write.





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3. Dry-Off Oven, after wash —Burdett Radiant Heat System — Cycle 3 min. 350° F.
4. 4-Stage Spray Washer.

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Recent Progress in Airless Spray Painting

By JAMES A. BEDE
President
Bede International Development Company

PROGRESS HAS BEEN MADE in perfecting the equipment for airless spray painting. This progress is the result of five years exploratory and research work expended in developing the equipment.

In the beginning, serious limitations were experienced in the equipment for this type of paint application (pump, hose, nozzle, and so on). The main obstacle was the abrasive action of pigments wearing out key parts. A specially designed air-operated piston pump, Teflon-lined fluid hose, and nozzles made from sapphire and tungsten carbide, were found to be the answers to the equipment problem. These items have been tested in production for over a year and proven satisfactory.

With this process, virtually all types of finishes, on all classes of products, can be sprayed.

Principles of Airless Spray

Atomization by straight hydraulic pressure is different from atomization by compressed air, and the film that is deposited will often have a different performance in set-up and flowout. Airless atomization is predicated upon harnessing the following forces:

1. Hydraulic Pressure (300 to 600 p.s.i.—20 to 40 atmospheres).
2. High Temperature (approximately 160 deg. F. for lacquers; 180-200 deg. F. for synthetics).
3. Air Resistance (jet velocity, encountering air resistance, causes the paint particles to subdivide).
4. Internal Force of Expansion. Paint is heated to such a point that the lower boiling solvent fractions create a strong vapor pressure (generally from 3 to 15 pounds). The sudden release of this vapor pressure (with the consequent conversion from a liquid to gas) creates an expansion and further subdivision of the atomized paint.

To express it in the simplest way, heat and pressure, two great basic forces of nature, are being harnessed. The high temperature, in most cases, would cause some solvent boiling to take place if it were not for the fact that the liquid is under compression. However, on release through the nozzle to atmospheric pressure, a certain portion of the solvent composition will instantly burst into a gas. Since there is a

great expansion (from 1,500 to 1 up to 1,800 to 1) when solvent is changed into a gas, it can be seen that this is an important aid to atomizing action. Thus solvent is used in the paint as an atomizing agent.

Whenever we attempt to atomize a liquid by straight hydraulic pressure, we encounter two negative forces which tend to resist atomization: viscosity and surface tension.

Therefore, satisfactory atomization is dependent upon the positive forces exceeding, to a sufficient degree, the negative forces. The success of the Bede airless spray process is possible because heating the paint lowers the viscosity and surface tension and creates the internal force of expansion.

To apply paint successfully by airless spray, these points must be considered:

1. Nozzle selection has a bearing on spray performance. The rate of material flow as well as angle of spray is entirely controlled by the selection of a nozzle. Large orifice nozzles are used for heavy bodied materials, small orifices for thinner ones. Experimenting is sometimes necessary for the technician to select the ideal nozzle.

2. Temperature setting of the paint heater has a strong bearing on the action of the solvents. The selection of a solvent blend and the selection of spraying temperature are inter-related problems, each having a bearing on the other. By increasing the temperature in the heater, in stages, the following effects will be observed:

a) Further lowers viscosity and surface tension.

b) Increases vapor pressure (enabling better atomization).

c) Flashes off more solvents from the atomized paint particles.

This favors the building of a heavier film thickness and at the

Table I

APPLICATION RECOMMENDATIONS FOR AIRLESS SPRAY PAINTING

Finish	Temperature (deg. F.)	Pressure (p. s. i.)	Viscosity (77 deg. F. No. 4 Ford Cup) (seconds)
Synthetic Enamels	180-210	400-600	32-40 (heavy film) 27-35 (light film)
Lacquer	165	500	30-38
Lacquer Sealer	135	400-500	22-30
Vinyls	180-190	500-600	27-35
Nylon	130	600	——
Neoprene	180	500-600	Below 27
Plastisols	Below 130	800-1500	As low as practical

same time, sets up the film dust-free more quickly.

In most cases, it is desirable to set the temperature on the heater as high as practical, until some obstacle is encountered which prevents going any higher. The objective is to take advantage as much as possible of the benefits that heating offers: makes possible spraying heavier bodied finish; increases vapor pressure (which gives better atomization); dissipates solvent from the finish. The amount of solvent that is extracted from the finish increases very sharply as temperature is increased. Obviously, there is an optimum point in solvent dissipation. This point depends on the nature of the individual job and what performance in finishing is being sought. Airless spray has been found to be the answer to many difficult problems for users. The sprayer can apply heavier film thicknesses. Air dry synthetics set up dust-free more quickly.

There are many painting jobs such as structural steel, large machinery and maintenance, where it is impractical to use a spray booth. On such jobs, airless spray painting is advantageous because of its lack of overspray (since there is no blast of air needed for atomization, there is little rebound of the atomized paint particles).

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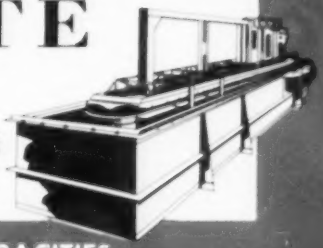

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   Built for racks requiring up to 5000 amperes
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   Easy to service with all mechanism above tank level
5. **STRONGEST—MOST RUGGED MACHINE**
   Lift accomplished by powerful bridge-type super structure
6. **REQUIRES LEAST FLOOR SPACE**
   Smallest center island—shortest length
7. **MOST FLEXIBLE MACHINE**
   Rack spacing variable to suit processing requirements
8. **SMOOTHEST OPERATING**
   Cushioned hydraulic lift and transfer
9. **A FOOL PROOF MACHINE**
   Positive hydraulic overload protection on lift and transfer
10. **MINIMUM INSTALLATION TIME AND COST**
    Completely built and test run at Udylite plant
11. **FINEST REPUTATION AND ACCEPTANCE**
    Over 700 hydraulically powered full automatics sold
12. **UNMATCHED SERVICE POLICY**
    No cost service before and after installation

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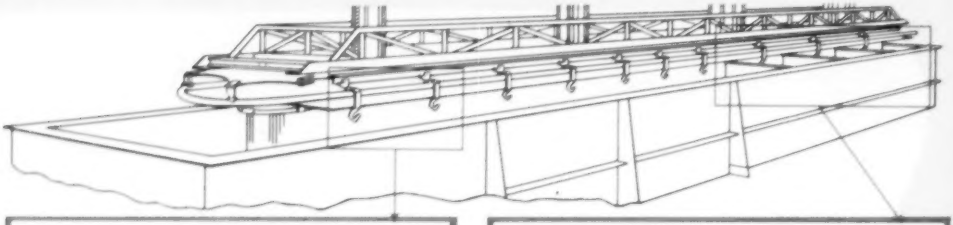
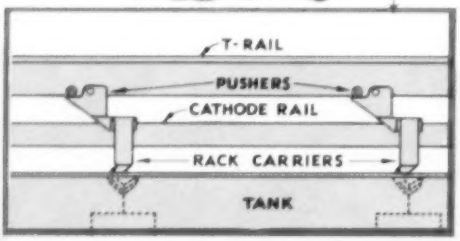
THESE OPERATING ADVANTAGES

ONLY UDYLITE MACHINES GIVE

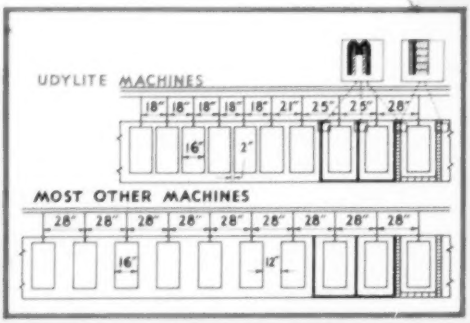
VARIABLE RACK SPACING—The drawings on this page illustrate the operation of Udylite exclusive variable rack spacing. A study of this and following pages will show the advantages of Udylite design. Here is how variable rack spacing will benefit you.

1. Allows for greater number of racks for any given length of machine. **2.** Saves on total machine length. **3.** Reduces floor space required in processing tank. **4.** Rack centers can be selected for best processing efficiency in that solution independent of rack centers in other tanks. **5.** Saves in gallonage of processing solutions required.



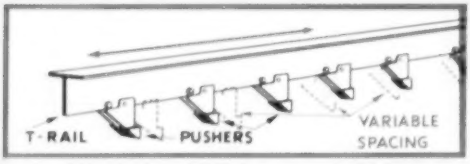


Udylite racks can be placed in the tanks exactly where you want them. This is accomplished by Udylite's ingenious but simple pusher mechanism. It eliminates the use of gears and chain which requires set distances of forward movement. Variable rack spacing allows *unlimited choice of rack centers in transfer or plating* for best operating conditions.

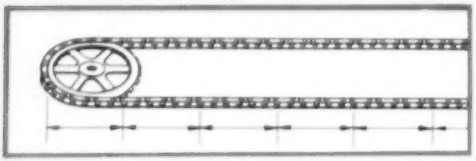


In the Udylite machine, different rack centers are no problem. They can vary in each tank regardless of different tank wall thicknesses. Rack center measurements in each processing tank are therefore chosen for the *best* processing efficiency in a particular solution regardless of the required centers in other tanks or the centers in transfer. In most other machines all rack centers are the same and are based on the width of the largest rack center used on the machine. The advantage of Udylite design is shown by the illustration above. In this example, one tank is brick lined, two are KOROSEAL* lined and the processing tank is steel. To obtain a 4" rack clearance from tank walls, Udylite design allows for a minimum in rack center measurements where tank walls vary in thickness and permits a 2" rack clearance in the processing tank. As can be seen, the Udylite machine will save 63" in rack spacing for ten racks when compared to the spacings of other machines.

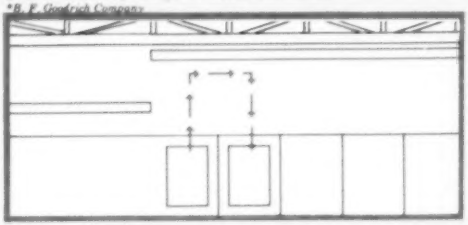
*B. F. Goodrich Company



The exclusive Udylite pusher system works from a T-rail which moves back and forth. It operates hydraulically. Pushers are attached to the T-rail and can be positioned at any desired spacing. Future changes in rack size or plating time may be easily accommodated by simple change of pusher spacings.

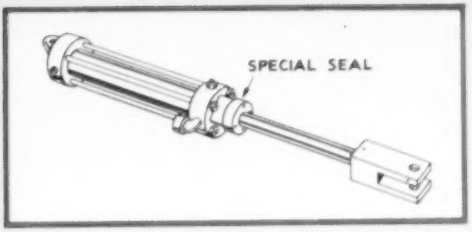


Udylite pusher system eliminates fixed carrier spacing necessary with chain driven machine.

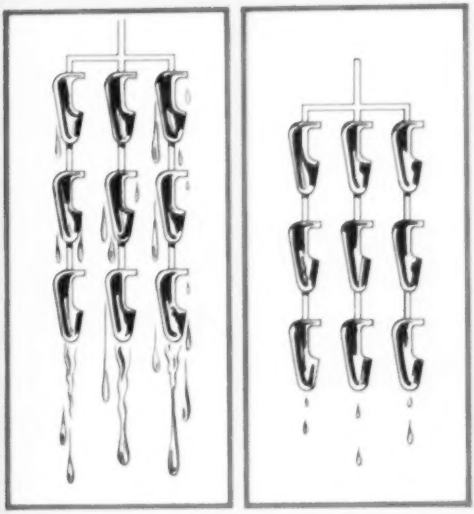


When work is transferred from tank to tank, all action is by square motion. This means minimum of forward travel.

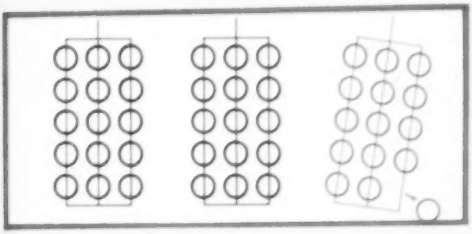
THESE OPERATING ADVANTAGES



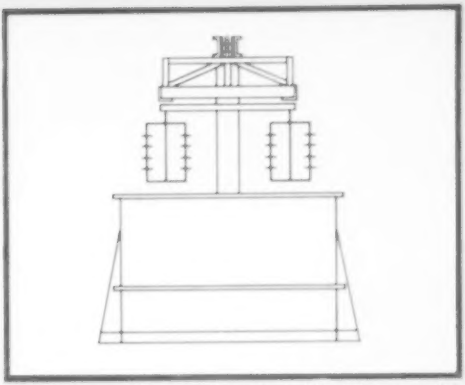
Lifting, horizontal movement and lowering of racks is done smoothly, effortlessly without jar or jerk by low-pressure hydraulic power with *separate speed controls for each movement.*



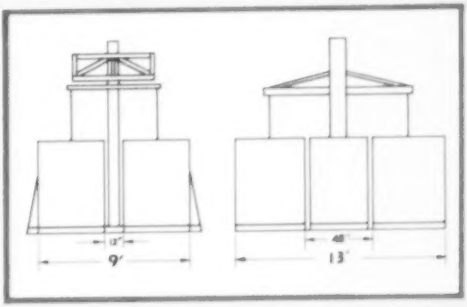
The smooth action of the hydraulic lift, usually set at not more than 40 feet per minute, greatly reduces dragout and solution contamination. The slow lift of work carriers allows surface tension to "wipe" most of the solution from the plated parts.



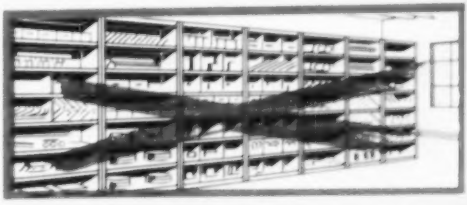
Use of hydraulic cushioned power and square transfer eliminates all whip and sway, even on racks up to eight feet long.



On Udylite machines, all work is lifted by powerful bridge-type superstructure, activated by a *low-pressure* hydraulic unit. Superstructures available for lifting racks in excess of 1000 pounds. There are no weight limiting arms on Udylite machines.

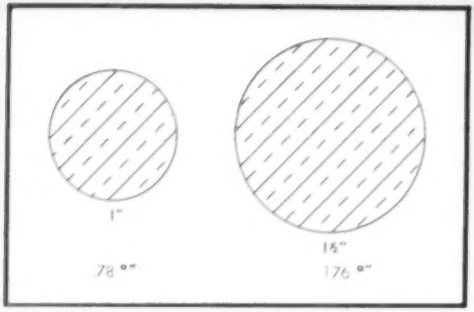


Most Udylite machines take up only twelve inches between tanks as compared to approximately forty-eight inches on other machines. *They are built and shipped on their own base.* As railway flat car or truck width limits are ten feet, this means Udylite machines can be shipped by truck or railway car in sections with tanks mounted do not need dismantling after factory run-in.

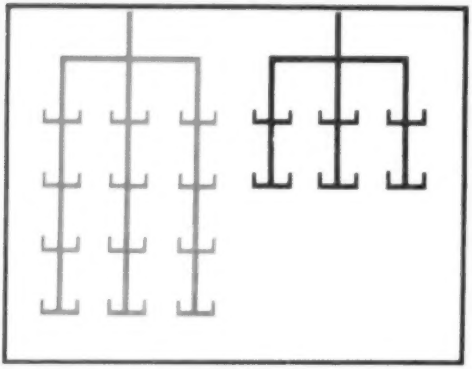


Because of its simplicity of design and fewer working parts, the stock of spare parts recommended for the Udylite automatic is amazingly small.

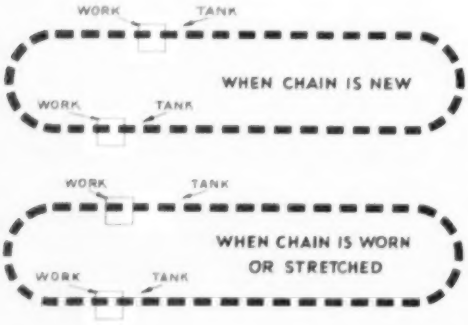
EXCLUSIVE UDYLITE OPERATING ADVANTAGES



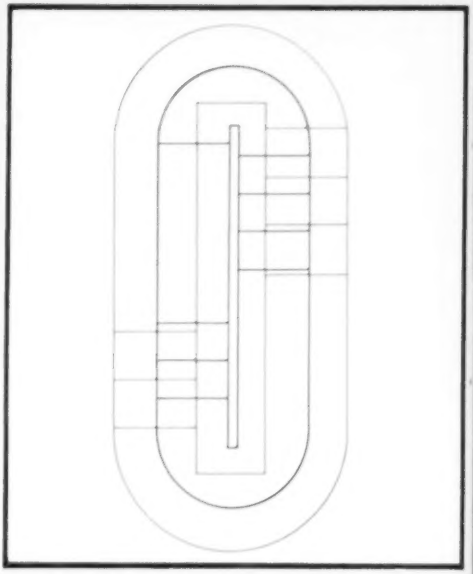
Udylite uses copper anode rods of 1½" diameter as standard. This allows for more current capacity. There is no sagging of rods under heaviest anode loads.



Only with the Udylite machine does the principle of operation readily lend itself to racks of extreme depth and up to 7 feet in direction of travel.



Udylite work carriers are positioned by pushers positively and exactly. Malfunction, due to chain stretch, wear or overtravel completely eliminated.



For an equivalent cycle and number of plating racks a Udylite machine will save approximately 4 feet in width and 20 percent in length.

UNMATCHED SERVICE POLICY

Before shipment of any Udylite machine, a layout print is mailed to the customer. This enables him again to check dimensions, make arrangements for water and electrical lines, for drainage, for steam and ventilation outlets. After checking, the print is returned to Udylite with the customer's approval.

After the return of the layout print and before actual shipment of the machine, a Udylite service man visits the customer, inspects the site, checks dimensions, water and electrical lines and other details preparatory to the installation of the machine. When the machine is built, the customer is notified and can make an inspection of the machine *in operation* at our plant. The customer is then notified of the date of shipment and arrangements are made for a Udylite service man to be at his plant when the machine arrives to assist in the installation.

A regular service program is a part of the Udylite policy. Each customer receives a routine call from a thoroughly trained and experienced Udylite factory service engineer once each six months to check the machine. And, of course, electrical, chemical or mechanical specialists are on call for any emergency. *These services are without cost to purchasers of Udylite Automatics.*

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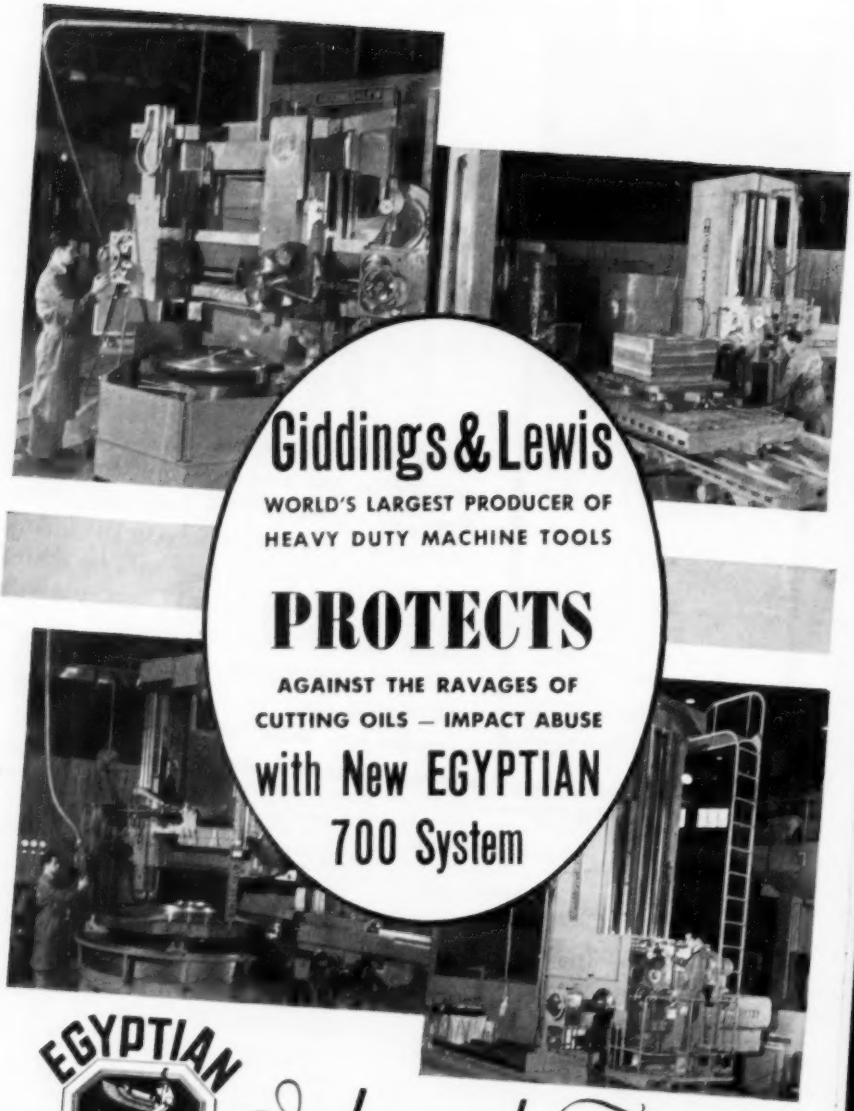

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"New Egyptian 700 Glaze dried even faster than systems making speed drying their basic claim to merit. In cases of exceptional rush, glazed work was satisfactorily sanded within an hour after application."

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"Egyptian 700 Glaze proved to be even freer sanding than competitive systems. Need for course sanding eliminated — sanding is done with #100 and #150 paper. Most small castings required NO sanding."

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"Egyptian 700 Glaze is unusually easy to apply by knife. Remained soft and workable for as many as 40 strokes. Shows no tendency to pull or roll. This remarkable workability makes it easy to Glaze large areas without showing lap marks."

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Practical Applications of Modern Products

Automobile Accessory Plant Automates Paint Finishing

Automated finishing operations have become commonplace in the giant industrial plants. Now the small and medium sized plants are beginning to install automated equipment scaled down and engineered to fit the smaller volume operations. Tann Corporation's story is a good example of the increased production and efficiency these systems offer the smaller manufacturer.

An example of a well-planned and well-executed automation program in a medium sized plant is a newly-modernized system at the Congress Die Casting Division of the Tann Corporation, Detroit, Michigan.

Fig. 1—Automatic finishing process begins with loading the conveyor. Painted parts return to and are unloaded at the same point.

With recently installed conveyorized equipment, Tann is supplying interior parts to automobile manufacturers. The instrument cluster housing for the 1956 Ford is typical of the parts supplied fabricated and painted, ready for installation.

The automation program in this plant has included the installation of an automatic paint baking system which uses electrostatic spraying at two points during the operation. The system was developed by Jensen Specialties and uses electric Pan-L-Heat ovens in both water dry-off and paint baking. The electrostatic spray booths and equipment were supplied by Gemco Equipment Co.

The system requires only two operators — one for loading and unloading parts (Fig. 1) and one for spraying the initial finish coat.

The finishing cycle starts and ends at the same point. Parts are carried through the complete cycle by 535 feet of continuous conveyor at an average speed of 10 feet per minute, with a seven to one speed variation. Work carriers on the conveyor are designed to carry two parts each.

Finishing begins with the automotive parts being carried into a five-stage washer and degreaser (Fig. 2). In this cleaning section, parts are washed, rinsed, phosphate coated, rinsed again, and finally chromate rinsed.

After cleaning and phosphatizing, parts pass through the two-pass water dry-off section of an infra-red oven. Heat sources are 2,000 watt sheathed resistance, rod-type heaters and 30 kilowatts of radiant heaters in a convection air heater box. Parts remain in the section four minutes at 212 deg. F. before continuing into a spray booth where a primer coat is electrostatically applied (Fig. 3).

The first finish coat is applied in a spray booth with manually operated equipment. This step gives greater film thickness and thus greater durability. The final coat is applied electrostatically (with two spray guns, as opposed to the one spray gun used to apply the prime coat).

Completely painted parts now enter the baking oven (Fig. 4), a six-pass infra-red compartment oven which is separated from the water dry-off section by a sheet metal baffle. Operating temperature of 300 deg. F. is attained with 96 kilowatts from 200 watt radiant rod type heaters and 30 kilowatts of radiant heaters in a convection air heater box. Actual baking time is about 12 minutes.

Air recirculation and exhaust for the two sections of the infra-red oven are separate. (Although both the water dry-off oven and the paint baking oven are in the same housing, they are separated by a sheet metal baffle and function individually.)

When baking is complete, the conveyor returns the parts to the starting

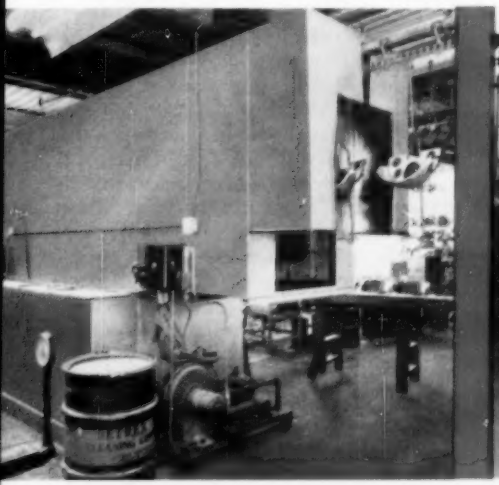


Fig. 2—Parts entering five-stage washing machine, which prepares surfaces for painting by cleaning them, applying phosphate coating.

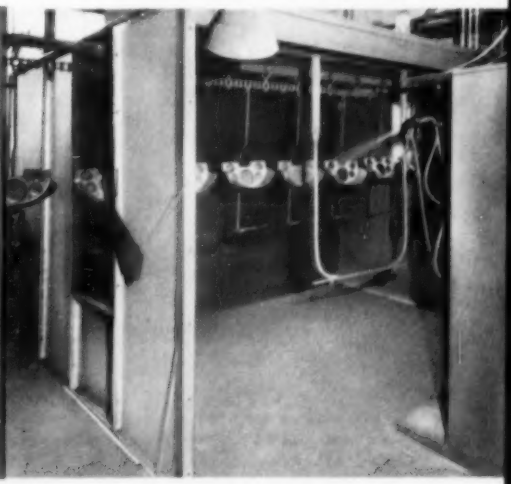


Fig. 3—One electrostatic spray gun is used for applying primer in this spray booth. Two electrostatic guns apply finish coat.

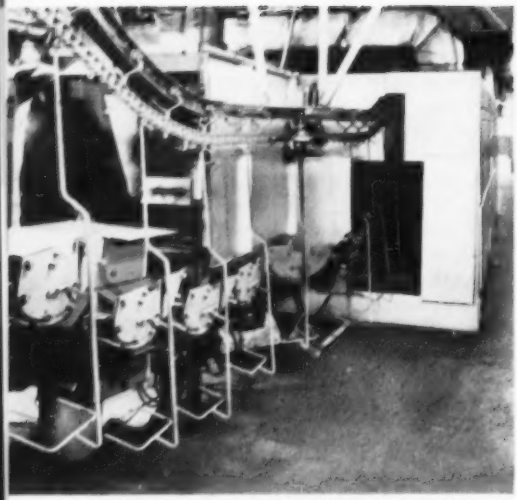


Fig. 4—Parts entering five-pass Jensen infra-red oven. Baking temperature is 300 deg. F. Conveyor carries parts through this section in about 12 minutes. Another section of this oven is used for dry-off after cleaning.

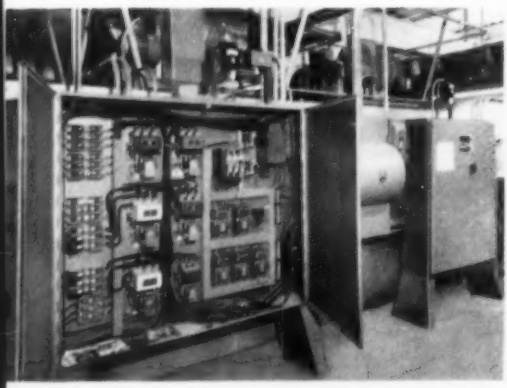


Fig. 5—Entire system is controlled from these floor-mounted electrical panels. Unit with doors open houses separate electrical controls for water dry-off oven, paint baking oven. Controls for five-stage washer are in separate cabinet to the right. (Photos courtesy Jensen Specialties, Inc., Detroit, Michigan)

point, where they are unloaded. New parts are then hung in their place to keep the cycle going.

The system can paint 380 parts per hour in any of five colors (color change takes place in about 30 seconds, and is controlled automatically by switches).

The installation is equipped with automatic shut-off devices to stop everything in case any section is not operating properly.

After the cycle is completed, an additional coat of flat lacquer is applied on some parts to reduce the glare. This step is not part of the completely automatic process.

For more data circle 1 on Reader Service Card

★ ★ ★

Tape's a Finishing Tool, Too

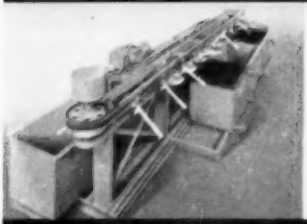
Ever since its invention and introduction to the automotive industry in 1925, pressure-sensitive paper masking tape has led the way to better and less expensive paint masking operations.

Its widespread use today marks it as one of the best selective or stop-off masking mediums for painting sharp lines, two and three colors, curves, circles and special shapes.

It is made to resist the penetration of paints, lacquers, and enamels; to stick in place tightly regardless of dry or wet sanding and yet to peel off easily and cleanly with no adhesive left behind; it can be obtained with a creped backing, which is especially good for circles, curves and contours, or with a flat backing that is desirable for straight-line painting.

Also, because of its widespread use and variety of applications, tape is

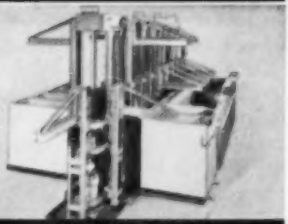
AN AUTOMATIC MACHINE FOR EVERY METAL FINISHING NEED



Low initial and low operating costs are features of this newly introduced small automatic which has a big capacity for its size.

"LITTLE STEVE"
Rack Type Machine

Unit's load capacity, mechanical flexibility and lift design meet tomorrow's increased safety and production requirements.



"STEVADOER"
Rack Type Machine

A compact automatic processing machine, embodying the famous Stevens auxiliary cam shaft and lifters for rapid vertical transfer.

MODEL "A"
Rack Type Machine

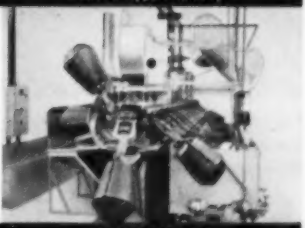
A proven automatic barrel machine for plating and processing small parts. Only unit with fully automatic load and unload features.

MODEL "C"
Barrel Type Machine

Features rapid, continuous movement processing employing hump type cams. Design permits utmost mechanical and cycle flexibility.

MODEL "B"
Rack Type Machine

Large capacity automatic barrel unit for volume production. Embodies major features of the famous Stevens Model "C" machine.



"SUPER E"
Barrel Type Machine

The Stevens family is now complete. Six Stevens automatic plating and processing machines fill every need for metal finishing.

Latest addition to the complete line of Stevens automatic metal finishing machines is "Little Steve." Announcement of the new "Little Steve" follows by a few months the recent introduction of Stevens heavy-duty "Stevadoer" Processing machine.

Now you can go automatic in any and all of your plating operations. Stevens can furnish a job-engineered, cost-cutting, fully automatic machine that will answer every production need whether it be for electroplating, cleaning, anodizing, bright dipping. You will get better control, better finishes and eliminate rejects with Stevens Automatics.

Why not see how one of Stevens great family of automatics can be engineered for your metal finishing operations? Call in a Stevens Sales Engineer today or write direct to —

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Offices in Principal Cities

Metal Finishing equipment and supplies from castings or stampings to finished product

FREDERIC B.
STEVENS
INCORPORATED
YOUR METAL FINISHING SUPERMARKET
DETROIT 16, MICHIGAN

For more data circle **174** on Reader Service Card

being marketed today with different tensile strengths, different backings, and different adhesives for specialized jobs. For example, there are types that will adhere instantly and securely to treated surfaces such as anodized aluminum; others that are stain resistant; and still others that will withstand baking cycles in the 350 to 400 deg. F. temperature range.

On the other hand, advancements in the technique of dispensing masking tape have progressed to a point where die-cut strips of tape can be automatically produced and applied to save time and money during painting.

A few of the industrial applications for masking tape are shown in the accompanying illustrations.

For more data circle **2** on Reader Service Card

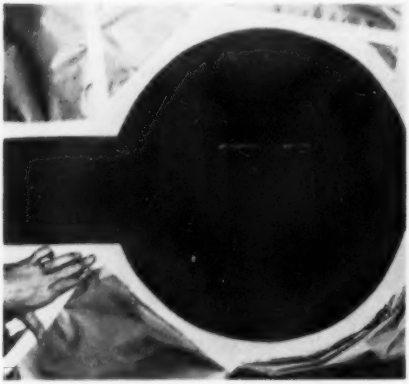


Fig. 1—Designs, insignias, and curved forms are masked easily for painting with conformable crepe-paper backed tape shown here.

Fig. 2—Pre-cut masking tape is used to mask special shapes quickly and accurately before painting without time-consuming cutting.

Fig. 3—Tape used to mask chrome strips on this cash register must withstand paint baking temperatures and still be easily removable.

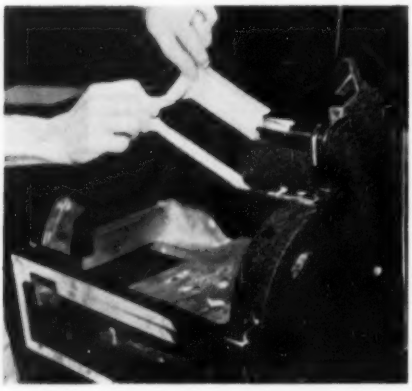
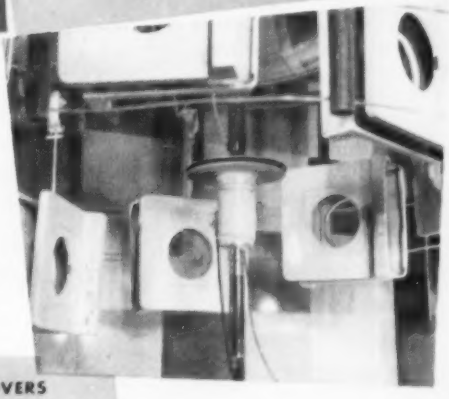


Fig. 4—Proper masking of automobiles for two and three color painting is vital. (Photos are courtesy Minnesota Mining and Mfg. Co.)

NOW *for the first time...*

PORCELAIN ENAMEL

is being applied successfully—
Yes, even spectacularly—
with RANSBURG NO. 2 ELECTROSTATIC SPRAY PROCESS



General Electric—an extensive user of Ransburg Electro-Spray for painting with synthetic enamels—is the first to use Ransburg No. 2 Process in the application of porcelain enamel.

GE—less than a year in electrostatic production—now is processing almost a million square feet of cover coat each month in the General Electric Home Laundry finishing department at Appliance Park.

DRYER TOPS AND WASHER COVERS ARE BEING COATED ELECTROSTATICALLY WITH THESE SPECTACULAR RESULTS

Quality of appearance and chip resistance are greatly improved with all colors: white, yellow, pink, turquoise, blue and brown.

About 97% of the atomized enamel is deposited on the washer and dryer parts.

Because of improved uniformity in coating thickness, weight of applied enamel was substantially reduced.

Because of lower application weight, the few rejected parts can be re-processed more times before being scrapped. This reduces the ultimate scrap rate by at least 95% of that previously expected.

Efficiency, measured by the amount of good ware, averages above 90%.

Want your products tested?

Ransburg has fully equipped laboratory facilities including reciprocating disks, helical conveyors, stationary disks, and the latest advancements in equipment for applying porcelain enamel with the No. 2 Electrostatic Spray Process. Manufacturers are invited to send sample products to our Indianapolis laboratories for tests and demonstrations to prove for you the advantages and benefits of electrostatic spray application of porcelain enamels.

Ransburg **ELECTRO-COATING CORP.**

Indianapolis 7, Indiana

RANSBURG

For more data circle **175** on Reader Service Card

Hot Spray Improves Finish

Installation of hot spray equipment has helped to increase production and at the same time produce an improved finish at the Kelley Manufacturing Co., Houston, Texas.

This company recently began fabricating 10-foot sections of 26-gauge electro-galvanized sheet metal "Z" forms. To finish them two automatic spray guns were installed. The sheet metal forms are fed into the spray booth by hand and sprayed with a white lacquer. A conveyor then carries them at the rate of 1½ feet per minute for 25 feet, past two banks of infra-red lamps. Now dry, the units are packaged for shipment.

The company ran into difficulties shortly after the installation was made, however. Film thickness and coverage were not coming up to specifications with one coat of lacquer from the automatic sprayers. The company tried applying two coats, but found that this slowed production too much and shot production costs skyward.

A Spee-Flo hot spray system was installed in an effort to get higher film build and better coverage in a single application. An electric eye was also placed on the line to interrupt gun operation when nothing is in front of the guns and to coordinate the conveyor movement with packaging.

Company officials report that hot spray was the answer to this problem. They are now getting adequate coverage, better gloss, better uniformity and less runs and sags, with only one coat of the lacquer. Control of viscosity is easier too, since temperature is no longer a factor in variation of the viscosity. Edges and corners are covered better, and the film deposited has a higher proportion of solids.

A free booklet on hot spray is published by the Spee-Flo Co., 720 Polk Ave., Houston, Texas.

For more data circle 3 on Reader Service Card

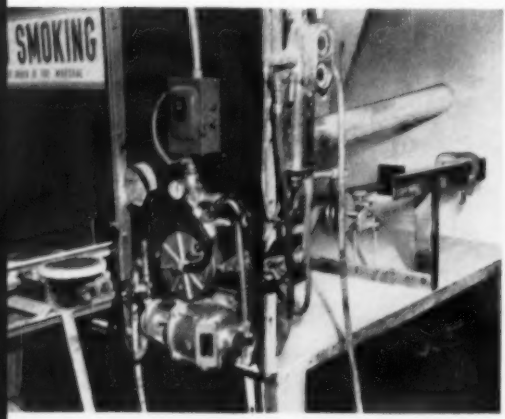
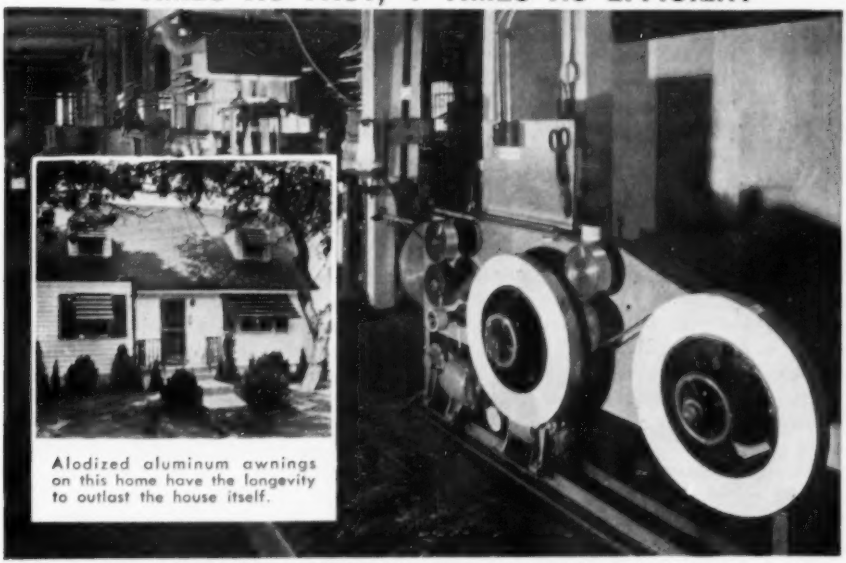


Fig. 1—Close-up of hot spray heater used for supplying heated paint to two automatic spray guns. Hot spray process has helped to produce thicker film with fewer runs and sags in a minimum of production time.

Fig. 2—Sheet metal "Z" forms are ejected from automatic spray booth onto conveyor, where they are immediately exposed to infra-red lights to speed drying. (Photographs courtesy The Spee-Flo Co., Houston, Texas.)

ALUMINUM AWNING MANUFACTURER FINDS ALODIZING 2 TIMES AS FAST, 4 TIMES AS EFFICIENT



Alodized aluminum awnings on this home have the longevity to outlast the house itself.

The very first continuous strip Alodizing line was installed by Orchard Brothers, Inc., Rutherford, N.J. This view of its plant shows the Alodized aluminum strip leaving the machine and being wound on the reels in the foreground.

Previous process needed more time and finish was too brittle for roll-forming after painting

Before being told about Alodine,® Orchard Brothers, Inc., maker of Alumaroll* awnings, used a crystalline phosphate coating to prepare its aluminum strip for enameling. Not only was this a slow and inefficient process, with many hours of downtime, but it made the finish too brittle to roll-form after painting.

Alodizing with Alodine has had a two-fold production benefit: it has cut operating costs about two-thirds and has increased output 50%. And the Alodine coating forms such a durable and tenacious bond that roll-forming of the slats after the enamel has dried does not damage the finish.

Another tangible advantage of Alodizing with Alodine is the technical assistance provided by ACP. Our Engineering and Service Departments not only recommend the proper equipment, but instruct plant personnel in its operation, and check samples of the finished product in our own Quality Control Laboratory.

We can offer the same product advantages to you. Write for complete information about the process today.

*T.M. Orchard Brothers, Inc., Reg. U.S. Pat. Off.

Orchard Brothers, Inc., and American Chemical Paint Co. are Members of National Metal Awning Association

AMERICAN CHEMICAL PAINT COMPANY, Ambler 14, Pa.

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CHEMICALS ACP PROCESSES

For more data circle **176** on Reader Service Card

Radiant Gas Units Dry Ceramic Coatings

A German-patented infra-red radiant gas unit is being used by Perfection Industries, Inc., Div. of the Hupp Corporation, Cleveland, Ohio, to pre-dry vitreous enameled building panels after spraying and before firing. These efficient heat sources are built into two banks, with 27 bulbs to a bank.

Each bank is 5 feet high and 8 feet long. Distance between them may be increased or decreased to vary intensity of the heat.

The pre-drying before burning of vitreous enamel requires one and a half minutes.

On many occasions, the company needs synthetic enamel furnace parts in a hurry, and these, too, are run through this oven because of the extra drying speed. The oven is capable of drying synthetic enamel items in four minutes.

The Perfection Industries Division of the Hupp Corporation is the sole American manufacturer of these German-patented infra-red radiant gas units.

For more data circle 70 on Reader Service Card

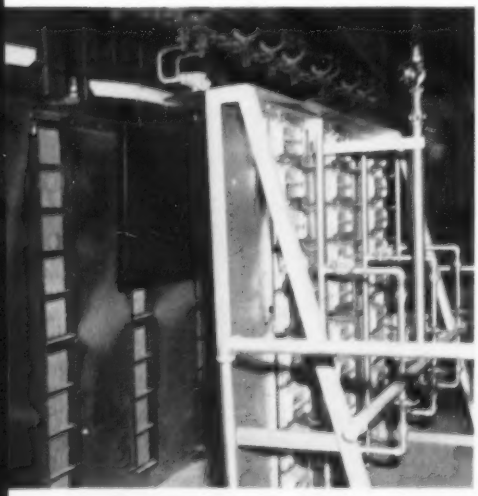
★ ★ ★

Finish Withstands 500 deg. F.

The upper grille of the Temco Gas Wall Heater is finished with Sicon, a silicone-base heat resistant finish manufactured by the Midland Industrial Finishes Co., Waukegan, Ill.

Normal operating temperatures run about 350 deg. F., but the temperature encountered on the blocked flue conditions require a heat resistant finish to withstand 500 deg. F. Sicon 7 x 7070 Brown on 25,000 Temco installations has successfully met field performance requirements without loss of color, gloss or adhesion, states the manufacturer.

For more data circle 4 on Reader Service Card

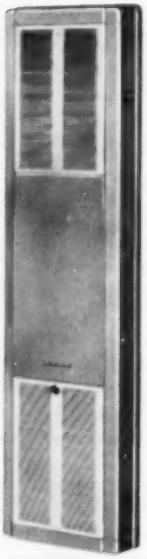


Two banks of infra-red radiant gas units dry ceramic coated building panels before firing.

★ ★ ★

Temco gas wall heater has Sicon silicone-based finish on upper grille. This heat resistant paint must withstand a temperature of 500 deg. F.

★ ★ ★



Announcing

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Z-B-2

LATEST ADVANCEMENT IN ZINC BRIGHTENING AGENTS!

BRIGHT Even at extremely high current density ranges the effectiveness of Z-B-2 is not lowered. It *stays* bright!

STABLE Z-B-2 is stable in plating solutions of ANY current density . . . . even at extremely high operational temperatures, and during "down" periods!

LIQUID Because it's a liquid, Z-B-2 is easy to handle and requires no special mixing or blending. It is ready to use immediately!

LONG LIFE Replacement schedules will be extended greatly because of the long life of Z-B-2!

BRILLIANT PROMAT'S latest advancement in zinc brighteners gives a beautiful, lasting, decorative finish that cannot be duplicated!

VERSATILE Z-B-2 can be used in still and barrel solutions, semi and fully automatic machines!

COMPATIBLE This great new product of PROMAT'S has been carefully designed to be completely compatible in ALL zinc solutions!

LOW MAINTENANCE COST PROMAT'S research and production team brings you this high-quality new development at very low maintenance cost!

With all these facts in mind, let us show you what this great new product can do for you. Our service engineers stand ready to give you actual proof of how Z-B-2 can serve you. Address your inquiries or write for technical bulletins on this or any of PROMAT'S great Protective Materials products direct to us.

PROMAT DIVISION – POOR AND COMPANY

851 SOUTH MARKET STREET, WAUKEGAN, ILLINOIS

For more data circle 177 on Reader Service Card

Chromium Plating Gravure Printing Cylinders

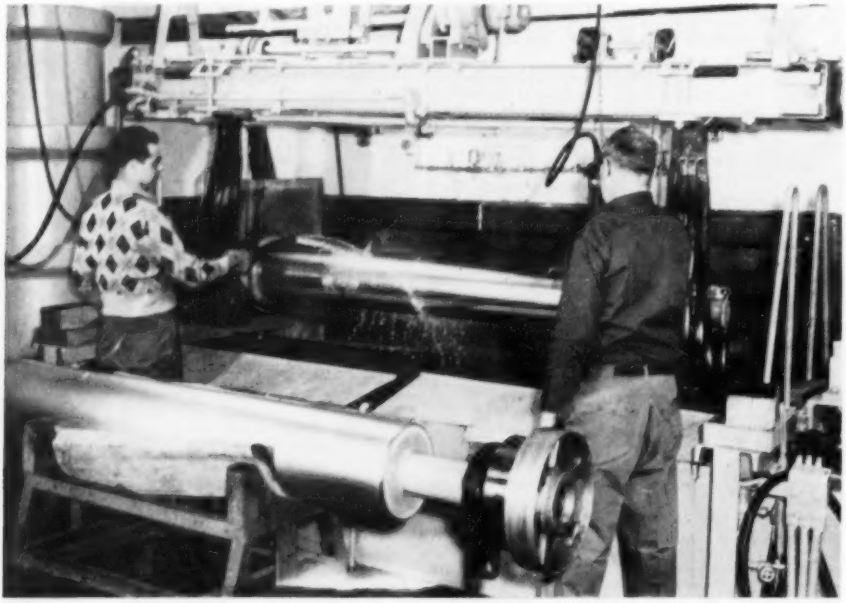
A specially designed horizontal, 600-gallon electroplating tank is being used to chromium plate gravure printing cylinders at Art Color Printing Co., Dunellen, N. J.

Each cylinder is held on a work carrier yoke over the plating tank while it is given a warm water pre-plating rinse. The tank was designed and built by Hanson-Van Winkle-Munning Co., Matawan, N. J. After the cylinder is rinsed, the yoke lowers it into the tank, where it is completely immersed for one hour. During this period the cylinder is continuously rocked 90 degrees to the right and left. The rocking assures a uniform chromium deposit.

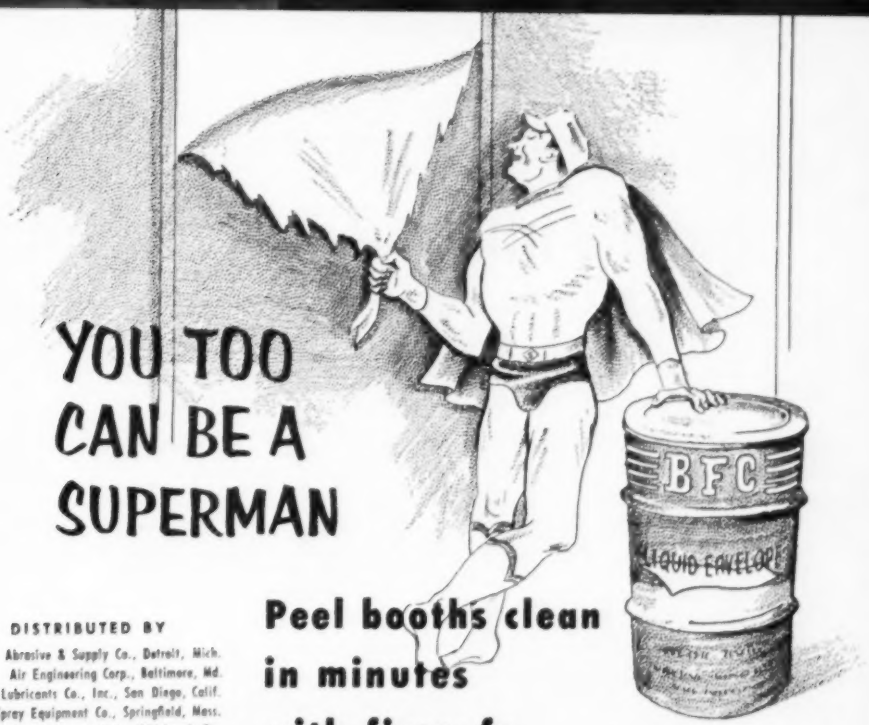
The plating bath is maintained at 113 deg. F. by vertical loop-type heating and cooling coils. Immersed in the bath are Chrome-Flo lead anodes, spaced three per foot. Plating current, passing through flexible plastic-insulated contacts, ranges from 2300 to 3400 amperes, depending on the size of cylinder being plated. A thickness of about 0.00025 inch of chromium is deposited in the process.

The complete plating operation includes cleaning, acid copper plating, polishing, etching and chromium plating. After cylinders have been used on a press run, they are stripped and replated by the same process.

For more data circle **5** on Reader Service Card



Gravure printing cylinders are given a warm water rinse prior to chromium plating in a specially-designed 600-gallon plating tank at the Art Color Printing Company, Dunellen, N. J. (Photograph courtesy Hanson-Van Winkle-Munning Company, Matawan, N. J.)



YOU TOO CAN BE A SUPERMAN

Peel booths clean in minutes with firesafe

"LIQUID ENVELOPE"

the original, firesafe, strippable SPRAY-BOOTH COATING

Spray on in minutes. When overspray accumulates, peel off in great big pieces. In minutes your booth is clean again.

Works like magic. Eliminates overtime clean-up work. Promotes firesafety. "Liquid Envelope" film will not burn or support combustion. Used over 10 years coast-to-coast.

Order 5-gallon test-sample at drum-lot price. See for yourself the savings you make.

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For more data circle **178** on Reader Service Card

"Our finishing output up 30%, quality improved–costs cut..."

says Mr. E. A. Nelson, General Manager, Imperial Lighting Products Company.

THE PROBLEM: To improve the finishing operation for aluminum light fixture parts. Production was continuous but composed of relatively short runs for varying shapes and sizes.

THE SOLUTION: A Binks semi-automatic spindle spraying machine. Rotating vertical spindles, mounted on a conveyor, spin the parts to be finished. As the parts pass the operator he coats them quickly and uniformly using a manually operated Binks Model 18 spray gun. The spindles are spaced to accommodate large parts on alternate spindles or smaller parts on every spindle.

THE RESULTS: So gratifying, according to Mr. Nelson, that a second Binks semi-automatic spindle machine was installed. Both machines have more than paid for themselves. A third, completely automatic, machine has been ordered for production-rate finishing of small parts.

- Automatic parts handling speeds production
- Finish is uniform
- Material waste minimized
- Rejects reduced

General view of the semi-automatic machines.

Free analysis and engineering help: If you would like to know what production rates or costs you could obtain with Binks semi-automatic or automatic spraying machines, Binks research department will run actual test on *your* products and supply you with a detailed report. Just call your nearest Binks Branch Office or write us direct.

For more data circle **179** on Reader Service Card

Faster finishing of higher quality is made possible by this Binks installation at Imperial Lighting Products Company, Latrobe, Penn.

Ask about our spray painting school. Open to all...
NO TUITION...covers all phases

Binks

EVERYTHING FOR SPRAY PAINTING

GUNS

SPRAY BOOTHS

COMPRESSORS

Binks Manufacturing Company
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New Equipment, Materials, Processes

Cleaning
Polishing
Plating
Finishing

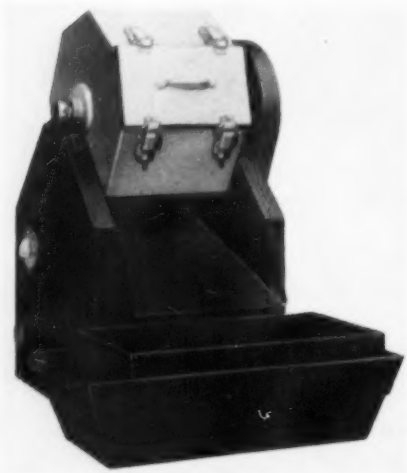
Barrel Finishing Machine

A built-in unloading chute minimizes handling operations necessary for tumbling parts in the Mastercraft Barrel Finishing Machine, recently announced by Mido Products, Inc., 1801 Border Ave., Torrance, Calif.

Work pieces, abrasive media, water and compound unload from the barrel opening down the chute, directly onto the separating screens, where the parts remain. Media can be reloaded into the barrel from the receiving pan.

Standard equipment on this barrel includes a timer, a 3/16-inch natural gum rubber vulcanized lining, screen, pan and washout door. Optional variable speed drive allows the operator to produce a wider variety of finishes. Single speed drive drives the barrel at 38 r.p.m. The motor is 1/3 h.p., 115 volt, 60 cycles, split phase.

For more data circle **5** on Reader Service Card



Mastercraft Barrel Finishing Machine has built-in unload chute to minimize handling

★ ★ ★

Sprayable Plastisol

Film thicknesses of 50 to 60 mils per spray coat can be obtained with a sprayable plastisol, announced by Electroplating and Coatings Division, Metal & Thermit Corp., Rahway, N. J.

Known as "Unichrome Super 5300," the coating makes possible gun application of the full solids content of vinyl plastisol without a diluent, the company reports. As a result, a pore-free 50 to 60 mil coat can be applied in one layer which gives "sheet" protection to tanks, ducts and other large equipment, it is stated. Because it is sprayed on, there are no seams or joints where corrosives might penetrate.

Measuring thickness of spray applied Unichrome Super 5300 heavy plastisol coating

A compound based on vinyl resins, Unichrome Super 5300 is resistant to the corrosive action of strong acids, concentrated caustic and salt solutions and other corrosive materials. Smooth in appearance, the material forms a tough, flexible film which absorbs impact without chipping, withstands abrasion and has desirable acoustical and electrical insulating properties, according to Metal & Thermit engineers.

For more data circle **7** on Reader Service Card

★ ★ ★

Anti-Fume Pellets

Smoothex, Inc., 10705 Briggs Rd., Cleveland, Ohio, has introduced a line of anti-fume pellets, designed to control spray from chromium plating tanks. A few pellets in a plating bath are said to improve the rinsing and drying operation and lower tank contamination, as well as protect the health of plating room workers.

Determination of the number of pellet additives to be placed into a plating bath for an initial charge is made simple. Since each pellet weighs exactly one ounce, the operator need only count out 72 pellets to make up the four-pound charge for 100 gallons.

Each pellet tends to keep the chromic acid in the bath, preventing the escape of fumes. The pellets will not break down under normal conditions. Once a tank is charged, the occasional addition of a few pellets in the bath is all that is necessary to maintain reduced surface tension.

For more data circle **8** on Reader Service Card

★ ★ ★

Vapor Degreaser

Aircon Model 75 vapor degreaser, designed to fill the gap between smaller, portable vapor degreasers and larger, higher capacity degreasers, has been announced by Armstrong & White, 224 Freeport Rd., Cheswick, Pennsylvania.

A working area of 24 by 40 by 24 inches, combined with a fast cleaning cycle permits a load capacity in excess of 750 pounds of steel per hour. Solvent requirement: 16 gallons, boiling sump, 24 gallons storage. It is suitable for use with either trichlorethylene or perchlorethylene solvents.

Operates on 220 volts a.c. only. Units are available with or without spray equipment.

For more data circle **9** on Reader Service Card

Aircon Model 75 Vapor Degreaser — designed for medium capacity requirements

Chromium Plating Additive

A catalyst, "CPA 1800" designed for both decorative and hard-chrome plating applications, has been announced by the Chromium Chemicals Div., Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14, Ohio.

In replacing a portion of the sulfate used in chrome plating solutions, Diamond CPA 1800 is reported to speed-up and simplify chromium plating operations. The material, consumed only through drag-out, is said to provide a number of advantages.

Principal benefits provided by the use of this new additive, the manufacturer says, include faster plating, broader operating range of plating solution, and greater covering power. CPA 1800 is also said to make possible the electrodeposition of brighter and harder chrome coatings, to simplify anoding in hard-chrome applications, and to improve the metallurgical characteristics of chromium plate.

Faster chromium plating is achieved, it is said, through an increase in cathode current efficiency and the use of higher current densities. Bright deposits are obtained over a broad temperature range.

Typical examples of work being chromium plated with chromic acid solutions containing Diamond Alkali's CPA 1800 additive.

Parts of widely varied shape, size and weight, particularly those of complex design and with intricate recesses, are also said to be plated more easily due to greater covering power of baths incorporating this additive.

In hard-chrome plating, brighter and harder deposits can be produced, thereby eliminating most grinding and buffing operations previously required, the manufacturer states.

For more data circle 10 on Reader Service Card

Find out how Electroplated

RHODIUM

→ SHIELDS
→ TOOLS OF
→ SCIENCE

against effects of Temperature Extremes — 000 to + 0000

Write for Data Sheet: "Electroplated Rhodium"

TECHNIC, INC.

39 Snow St., Providence, R. I.
JAckson 1-4200
Chicago Office — 7001 North Clark St.

For more data circle 180 on Reader Service Card

★ ★ ★

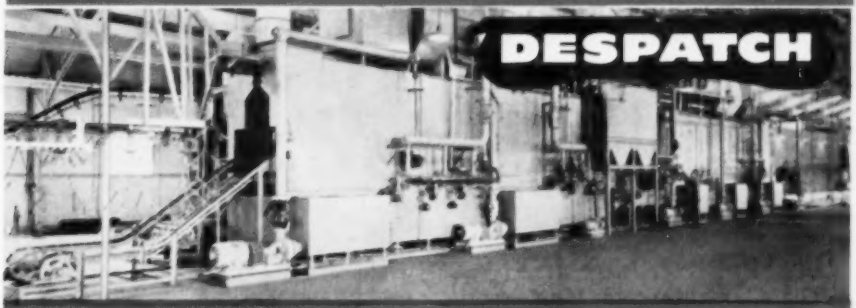
Epoxy Size

The Watson-Standard Company, 225 Galveston Ave., Pittsburgh 30, Pa., has announced an epoxy size coating for use in metal decorating.

This size, designated as Watson-Standard 17-331 Size Coating, is based upon a special epoxy ester resin. Its formulation is the result of efforts to devise a size coating which would minimize the differences in tin plate conditions, and provide a suitable surface for subsequent coatings.

This coating should be of interest to

Jones and Laughlin Produce Better Barrels To Fit Today's Marketers Needs with—



Looking from load/unload end of Despatch 5-stage washer at Jones and Laughlin barrel plant.

Load/unload end of phosphatizing machine at Jones and Laughlin.

Mechanized From Washer to Finish Bake Oven

5-stage washer (1) cleans, (2) water rinses, (3) zinc phosphate coats, (4) rinses, (5) chromic acids barrels, tops, bottoms. Use of combination overhead monorail and slat type conveyor permits maximum production speed of all units with space conservation. Another example of achievement in quality production with cost savings made possible by 54 years experience of Despatch engineering, manufacturing and installation services.

Barrels are fed after painting to this Despatch finish Bake Oven on continuous conveyors.

DESPATCH BUILT
Finishing Systems
Write Today for Bulletin 51C

a colorful presentation of Despatch facilities to aid manufacturers requiring better methods for metal finishing.

Minneapolis Office: 619 S.E. 8th Street
Chicago Office: 4554 N. Broadway
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DESPATCH OVEN COMPANY

PIONEERS IN ENGINEERING FINISHING SYSTEMS FOR INDUSTRY

For more data circle 181 on Reader Service Card

manufacturers of screw caps, closures, crowns and cans. No. 17-331 Size Coating can be used under alkyd, vinyl and epoxy type base whites and colors. When used under vinyl base whites and colors, improved flow characteristics are provided, it is stated.

This size is said to impart good adhesion, fabrication and hoppering resistance to systems in which it is used.
For more data circle 11 on Reader Service Card

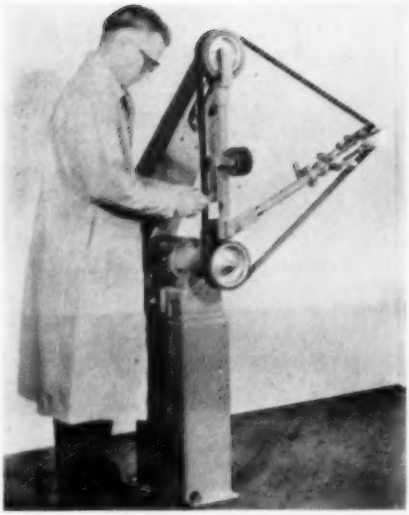
★ ★ ★

Abrasive Belt Machine

The Curtis Machine Corporation, Jamestown, N. Y., has announced Model DBA-1F Flex-A-Belt, a machine on which it is possible to perform all basic abrasive belt operations.

The extension arm assembly can be rotated a full 360 degrees on the motor hub to allow the most convenient operating position for various applications. On the Flex-A-Belt the following operations can be performed: formed contact wheel grinding operation on a contoured piece; flat grinding application on a platen; direct contact wheel grinding operation with a work rest; grinding or polishing operation on a hard-to-get-at area with interference-free idler contact roll.

The DBA-1F is a double end motor unit and is available in three varieties: with two Flex-A-Belt arms; with one Flex-A-Belt arm and one standard contact wheel grinding arm; with one Flex-A-Belt arm and one side of the motor open for grinding wheel, buff or brush application. Additional information is available in circular A 1357.
For more data circle 12 on Reader Service Card



Curtis Model DBA-1F Abrasive Belt Machine

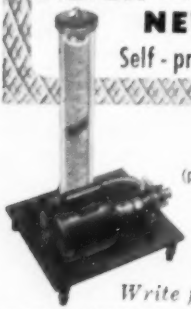
★ ★ ★

Rough-Finish Gloves

Surety Rubber Company, Carrollton, Ohio, has announced a rough-finish

to page 90→

FILTER with a Sethco NEW, exclusive Self-priming PUMP



Model LSIN-20
300 gal./hr.
(portable: 14"x16"x24" high)
filters solutions
from ph 0 to ph 14

25 other models
to fit your needs

Write for Folder

- **FILTER ASSEMBLY:** High temp. lucite. Two #10 cotton or dynel filter tubes on ss core.
- **PUMP:** Stainless steel 316, self-priming.
- **MOTOR:** ¼ H.P., totally enclosed, ball bearing, Capacitor, 110 V, 60 Cy., 1 ph.
- **PANEL:** Linen impreg. phenolic laminate, 14" x 16" x ½" thick; rubber tire, ball bearing casters.

HOSE: 20 ft. reinforced 2 ply chemical hose.

Sethco Mfg. Co.

70-72 Willoughby St., Bklyn. 1, N. Y. • ULster 5-8940

For more data circle 182 on Reader Service Card

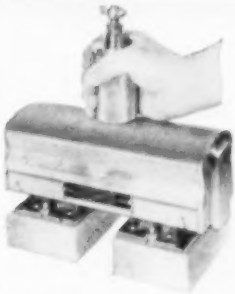
Which Model for YOU?...

SUNDSTRAND AIR SANDERS

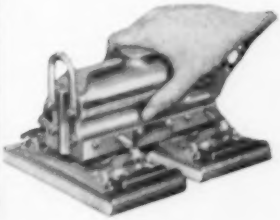
OS-700—new fast-action orbital sander. Single pad. Over 6000 cycles per minute. Removes material faster, easier. Built-in water attachment for wet sanding. 5 lb.

1000—light, fast, easy-to-handle straight-line sander. Big abrasive area. 2500 oscillations per minute. For wet or dry sanding. Palm lever controls both air and water. 7½ lb.

SP-101—versatile, single-pad, straight-line sander. 3000 oscillations per minute. Excellent for fine work on smaller pieces. 5 lb.



600—heavy-duty, straight-line model for sanding, pumice rubbing, or polishing. Sands wet or dry. 1100 oscillations per minute. 30 lb.



4000—9 lb., 2-pad, straight-line sander for longer, slower stroke. Built-in water attachment. 2100 oscillations per minute.

SUNDSTRAND MACHINE TOOL CO., Pneumatic Division, Rockford, Illinois

SUNDSTRAND

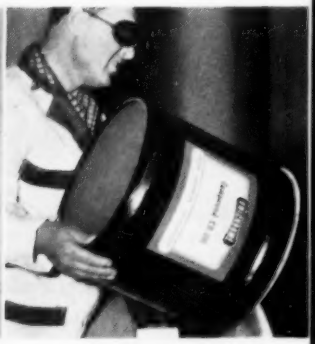
A name to remember in **AIR SANDERS**

For more data circle 183 on Reader Service Card

News about UNICHROME

Trade Mark

SRHS® chromium



Self-regulated SRHS maintains its wide bright plating range and assures quality deposits. Note how on above part the plate misses no areas yet burns no projections. To maintain the SRHS Bath, an easy, solution-density reading is taken. When reading indicates need for solu tion maintenance, simply adding a single SRHS materia as above will bring solution back to optimum platin balance and keep it there.

Successful barrel for plating chromium

Small parts are being quality plated easily, quickly and with great economy today in Unichrome 24-inch batch-type Chromium Plating Barrels. Batch plating permits time to be varied to control deposit thickness. The operator loads parts into the barrel, unloads from a tray minutes later. Work shows no contact marks. The whole unit occupies only 4x6 ft. floor space.

BRIGHT NICKEL PROCESS WITH STABILITY

Over 4 years' service experience with Unichrome Bright Nickel shows a consistent pattern of performance. The brighteners are stable and long-lived. Control problems are further simplified because the bath tolerates impurities so well. As for the bright deposits, they exhibit unusual receptivity for the subsequent chromium plate. Send for more information.

COATINGS for METALS

Metallic . . . . . Organic . . . . . Decorative . . . . . Protective

mproves plating operations

Platers find they cut costs and improve plating quality, too, when ordinary chromium is replaced with Unichrome SRHS Chromium Solutions. Today's large-scale acceptance of this leading process confirms that such benefits are obtained consistently.

EASIER OPERATION

One remarkable feature about SRHS Solutions is the self regulation of important chemical constituents. By maintaining themselves in peak plating balance, the baths give platers greater freedom from control problems and a more foolproof operation.

DOUBLE THE SPEED

Using SRHS Chromium, plants have been plating up to twice as fast as with ordinary chromium. Power consumption frequently drops, too, due to higher cathode efficiency. Many a hard-pressed plant has gained more production capacity without extra equipment merely by switching to SRHS Chromium.

QUALITY DEPOSITS

Unichrome SRHS Solutions have wider bright plate range. They thereby reduce burning and missing . . . major causes of rejects.

These time-confirmed improvements are worth full investigation by any plater still working with ordinary chromium. Send in for details.

UNICHROME is a trademark of Metal & Thermit Corp.

METAL & THERMIT
CORPORATION

General Offices: Rahway, New Jersey
Pittsburgh • Atlanta • Detroit
East Chicago • Los Angeles
In Canada: Metal & Thermit–United Chromium of Canada, Limited, Toronto 1, Ont.

For more data circle **184** on Reader Service Card

coated fabric glove designed to provide a positive grip and withstand oils, acids and solvents.

The coating combines a vinyl base and Surety Sureseal rough finish, affording resistance to chemicals as well as resistance to snagging and abrasion.

Surety Rough-Finish Gloves resist chemicals

Called Surety Griptite Coated Work Gloves, they are available with coated palm and knit wrist or fully coated with knit wrist, twelve-inch gauntlet or safety cuff. Women's sizes with coated palm are furnished with knit wrist only.

For more data circle **13** on Reader Service Card

★ ★ ★

Stack Cap

A stack cap for use in industrial exhaust systems has been added to the line of industrial air-moving equipment now being manufactured by the Hartzell Propeller Fan Company, Piqua, O.

Stack Cap for Industrial Exhaust Systems

The Hartzell stack cap is a simple band of 20 gauge galvanized steel mounted on an angle iron ring which bolts to a similar ring on the end of the vent.

Two lids open automatically when the system is operating, and close weather-tight when the fan goes off. When the lids are open, the air stream prevents the entry of rain or snow.

The Hartzell stack cap is available in 11 sizes, 12 to 48 inches in diameter.

For more data circle **14** on Reader Service Card

★ ★ ★

Precleaning Process For Buffed Metals

A process for precleaning buffed zinc die castings and other metals preparatory to plating has been an-

NOW
FUSECOAT
"T"
coating of
Tungsten Carbide
Licenses available
U.S. PAT. #2,694,647

LONGER WEARING FIXTURES
For Polishing and Buffing Machines

Your buffing and polishing fixtures that are subject to wear can now be FUSECOATED to last longer. Fixtures designed for FUSECOATING can be lighter and are less expensive for you to make. Procedure sheets are available. Write for folder or send us drawing or sample of part to be coated. We will send you a cost estimate and approximate delivery date by return mail.

FUSION METAL COATING CO. • 25493 W. 8 MILE ROAD DETROIT 19, MICHIGAN

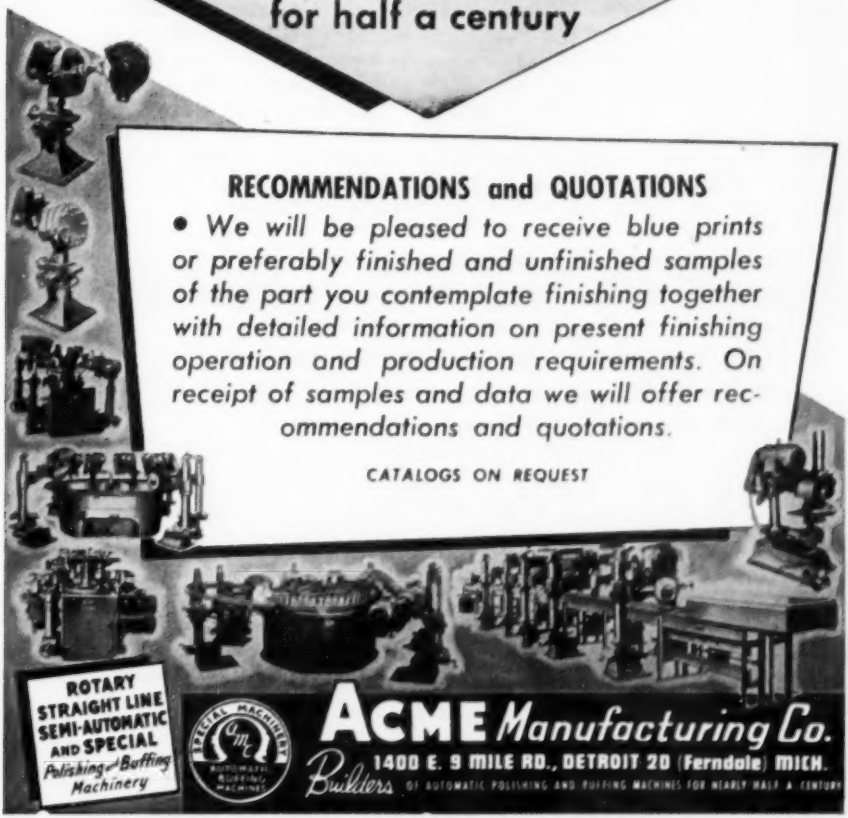
For more data circle **185** on Reader Service Card

ACME Automatics

FOR HIGH PRODUCTION at LOW COST on

POLISHING and BUFFING • DE-BURRING
WIRE BRUSHING and MICRO-FINISHING

• Proved performance and dependability in industry for half a century



RECOMMENDATIONS and QUOTATIONS

• *We will be pleased to receive blue prints or preferably finished and unfinished samples of the part you contemplate finishing together with detailed information on present finishing operation and production requirements. On receipt of samples and data we will offer recommendations and quotations.*

CATALOGS ON REQUEST

ROTARY STRAIGHT LINE SEMI-AUTOMATIC AND SPECIAL *Polishing and Buffing Machinery*

SPECIAL MACHINERY — AUTOMATIC POLISHING MACHINES

ACME Manufacturing Co.

Builders OF AUTOMATIC POLISHING AND BUFFING MACHINES FOR NEARLY HALF A CENTURY

1400 E. 9 MILE RD., DETROIT 20 (Ferndale) MICH.

For more data circle **186** on Reader Service Card

nounced by Wyandotte Chemicals Corporation. Three Wyandotte Products were developed for this process. A patent has been applied for on the key product—Mersoclean-540.

The Wyandotte process lessens fire hazards (flash point of the key product is above 210 deg. F.).

The process (Mersoclean-540, Expray-541 and Wyandotte 608) employs bi-layer soak cleaning followed by spray washing for complete removal of all buffing and polishing compounds including those baked on.

All of the Wyandotte Products are essentially odor free and non-toxic.

The spray cleaner, Expray-541, will not foam excessively even with high pressure and heavy contamination of buffing compound, it is stated.

The Wyandotte precleaning process protects die cast and brass parts against staining during production delays or parts storage before plating. Work needs only brief electrocleaning before the usual acid dips and strike baths before plating.

For more data circle **15** on Reader Service Card

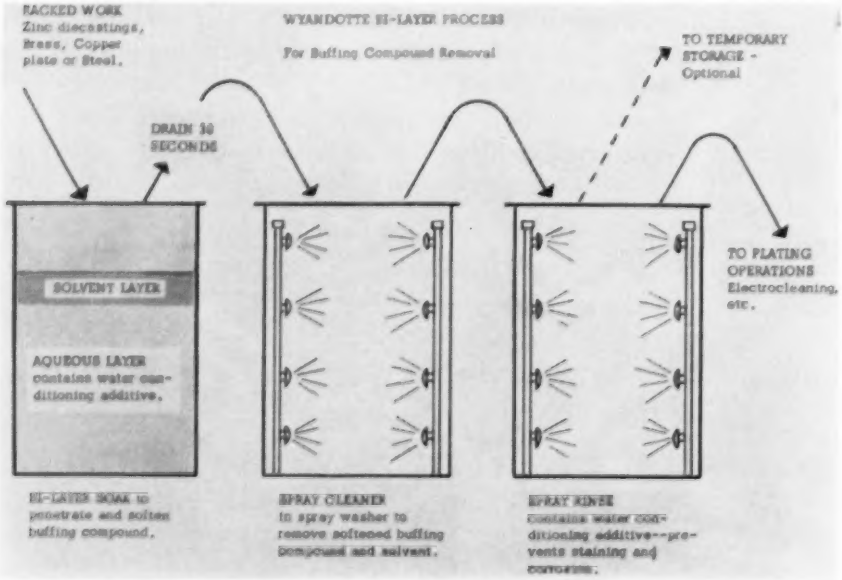
★ ★ ★

Air-Powered Belt Grinder

Development of an air-powered portable abrasive belt machine has been announced by the Abrasive Machinery Corp., 432 S. Pennsylvania St., Indianapolis 25, Ind.

The Universal Air-Powered Portable Belt Grinder is useful in performing many finishing operations, including light weld removal. It can be used as a standard portable belt grinder by using the contact wheel and is capable of deburring large parts.

Slack of the belt can be used for polishing contoured parts. When the platen is mounted, flat grinding operations can be performed.


RACKED WORK
Zinc diecastings, Brass, Copper plate or Steel.
WYANDOTTE BI-LAYER PROCESS
For Buffing Compound Removal
TO TEMPORARY STORAGE - Optional
DRAIN 10 SECONDS
SOLVENT LAYER
AQUEOUS LAYER contains water conditioning additive.
TO PLATING OPERATIONS Electrocleaning, etc.
BI-LAYER SOAK to penetrate and soften buffing compound.
SPRAY CLEANER in spray washer to remove softened buffing compound and solvent.
SPRAY RINSE Contains water conditioning additive--prevents staining and corrosion.

...ask BAIRD about it

Find out why this BAIRD Model H is the best Tumbling Machine for many installations

Tumbling operations have become one of industry's most effective low-cost production methods . . . with wide-open opportunities for increasing application.

The Baird Model H machine . . . entirely new in design . . . has been developed with these important expanding applications in mind. It is essentially a production-line machine . . . built to pay out in freedom from maintenance, long service life, and operating ease when installed for constant-duty service.

It is "clean limbed" and efficient, with "finger-tip," effort-saving controls for either manual-hydraulic or power tilting. All types of barrels may be accommodated, and Baird furnishes a complete selection, including electrically heated types.

If your requirements call for tumbling machines capable of constant, dependable production-line operation at minimum cost per service hour, this NEW BAIRD MODEL H will be your best selection. Our experience is yours to call upon . . . "Ask BAIRD about it." Write Dept. PF.

AUTOMATIC MACHINE TOOLS • AUTOMATIC WIRE & RIBBON METAL FORMING MACHINES • AUTOMATIC PRESSES • TUMBLING BARRELS

THE BAIRD MACHINE COMPANY
STRATFORD CONNECTICUT

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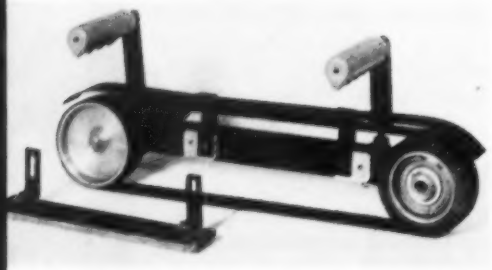
For more data circle 187 on Reader Service Card



Universal Air-Powered Portable Belt Grinder

The grinder may be mounted on the back cross slide of a lathe for polishing cylindrical parts, using feed screw for traversing. It may also be bench mounted for off-hand grinding, polishing and deburring on the contact wheel.

KING KOB
Cleaning Material

Industrial corn cob for the Blasting, Electroplating, Tumbling, Foundry, Burnishing and Polishing trade.

ALL SIZES
No. 10 to Flour

Jobbers and Distributors write for open territories.

IOWA CORN BY PRODUCTS CO.
BOX 187 NEVADA, IOWA

For more data circle 188 on Reader Service Card

Weighing only slightly over eight pounds, it is highly maneuverable.

Belt tracking is accomplished from a pivoted shaft which carries the contact wheel. Belt tensioning is effected by a telescoping wheel head in the square beam member, which also houses the spring.

The handles, belt guard and platen can be reversed to make either a right or left-hand belt grinder. Straight handles are available if desired.

For more data circle 16 on Reader Service Card

★ ★ ★

Paint Pump

DeVilbiss Paint Pump

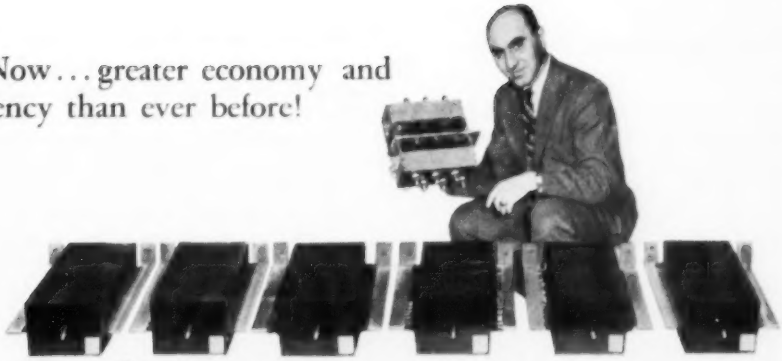
A pump engineered specifically for the handling of paint, built throughout with materials which are resistant to solvents found in paints, has been introduced by the DeVilbiss Company, 300 Phillips Ave., Toledo, Ohio. DeVilbiss engineers point out that the pump is built especially for the handling of paint used in spray application.

The pump is suited for use in a large or small circulating system, and its portability feature makes it useful to the maintenance painter.

The pump, designated P-QBF, is made in several models to fit individual needs. It will handle material direct from a 55-gallon drum, eliminating the need for frequent refills and thus reducing spillage and wasted material. One model is built with a 10-gallon hinged lid tank.

The pump is operated by compressed

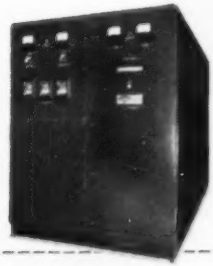
Now... greater economy and efficiency than ever before!



Sel-Rex

GERMANIUM

PLATING RECTIFIERS



Efficiency up to 96% — for the life of the unit — is yours with Sel-Rex Germanium Rectifiers. Over 5 years of intensive experimentation and field tests prove that the Sel-Rex Germanium cell experiences no chemical deterioration or ageing. You get more amperes of maintenance-free power per dollar invested than with any other rectification equipment.

There's an appreciable saving in floor space too. A Sel-Rex Germanium Rectifier generally occupies only half the floor space of a conventional unit of equal capacity.

Graphic illustration of the compactness of Sel-Rex Germanium rectifiers is seen in the above photograph. One germanium cell does the job of six conventional selenium stacks. You save a lot of valuable floor space which can be utilized for other equipment or additional work area.

Sel-Rex GERMANIUM RECTIFIERS are custom engineered to your specific requirements ... available in either air or water cooled models, with all types of fully automatic and remote controls. Units from 25 up to 50,000 amperes.

BART-MESSING CORPORATION PF-7
229 Main Street, Belleville 9, N. J.

Gentlemen:

Please rush literature on Sel-Rex GERMANIUM RECTIFIERS

Name .....

Company .....

Address .....

City ..... Zone ..... State .....

Distributor Inquiries Invited

Sel-Rex Rectifier Division

BART-MESSING CORPORATION

229 Main Street Belleville 9, N. J.

It costs no more to own the finest with Sel-Rex

For more data circle **189** on Reader Service Card

air and requires no wiring. Air consumption is low with no more than 100 pounds pressure required for volume discharge. Delivery pressure is approximately 200 pounds at the pump with compressed air set at 100 pounds.

In operation, the double action pump, delivering material on both the up and down stroke, provides a constant supply of fluid under all conditions. As many as 18 spray guns can be supplied with more than one quart of material per minute. Any variations in material consumption requirements are compensated for by the pump, which automatically changes speed.

The pump is equipped with a controlled by-pass for the recirculation of materials. This feature provides more uniform delivery pressure as well as a means of keeping certain types of materials well agitated. For the very heavily pigmented materials, an air motor driven agitator is available.

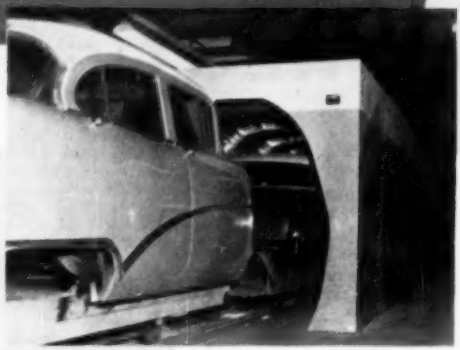
Lubrication of the pump is accomplished automatically by a mist type oiler which controls the oil introduced into the pump motor.

DeVilbiss also has designed an air lift for quick and easy changing of the pump from an empty to a full drum of material.

Complete information about the pump and its use in various hook-ups is contained in an eight-page booklet (form 1-3100) which may be obtained

LEADING AUTO MANUFACTURERS INSTALL CLEPCO QUARTZ OVENS

Find CLEPCO Quartz Paint Ovens require half the floor space and half the KW input of infra-red bulb ovens.



HERE'S WHY...

CLEPCO Quartz Paint Ovens are based on the use of special CLEPCO Quartz Heaters designed to emit that part of the heat spectrum most readily absorbed by paints.

Another major auto manufacturer reports that CLEPCO Paint Ovens are lower in original cost as well as in operating costs than the conventional gas fired convection ovens previously in use.

CLEPCO'S Complete Research Facilities are at your service to determine the most efficient quartz oven for your requirements.

SEND FOR COMPLETE INFORMATION

THE CLEVELAND PROCESS COMPANY

1965 EAST 57TH STREET • CLEVELAND 3, OHIO

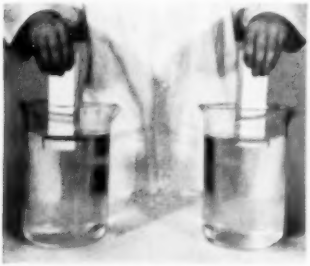
CLEPCO

For more data circle 190 on Reader Service Card

How Aluminux process prevents

ROCK-HARD SCALE

in your etching tanks



IDENTICAL ALUMINUM EXTRUSIONS *are placed in equal-strength solutions of Diversey Aluminux (left) and an ordinary etchant (right).*

ALUMINUM HAS NOW BEEN DISSOLVED IN BOTH SOLUTIONS, *but look at the difference! In the Aluminux solution at left, the dissolved aluminum has been held in solution with no trace of precipitate. But, in the ordinary etchant at right, the solution is cloudy with a heavy precipitate. This precipitate is aluminum oxide, the deposit that builds up as rock-hard scale inside your etching tanks.*

WHAT SCALE IS COSTING YOU

Any way you look at it, the time-consuming job of hacking away at scale inside aluminum etching tanks is a terrible waste. It means down-time and lost production, wear and tear on equipment, non-productive use of expensive labor (and probably at overtime rates). Scale runs up costs in other ways too, such as cutting down efficiency of heating coils and adhering to work in process.

The serious problem of scale and sludge in etching tanks has been successfully eliminated by the Diversey Aluminux process. As these photos show, Aluminux contains a chemical agent that holds dissolved aluminum in solution, instead of depositing it on tank walls and heating coils in the form of sludge and scale. In a 1500 gallon tank, for instance, Aluminux holds up to 1,000 lbs. of dissolved aluminum in solution . . . *a potential one ton of scale that would otherwise have to be chipped off!*

SUPERIOR FINISH AND FASTER ETCH RATE

The production-line performance of Aluminux during the past few years has proved its remarkable advantages. These include: (1) Far less frequent dumping . . . solutions last up to 4 times longer with no scale build-up, (2) superior, even, diffused satin-finish and cleaner work, (3) faster rate of etch and increased production, (4) lower maintenance costs . . . tanks are simply hosed out when re-charging, (5) precision control of degree of etch.

For more facts about the exceptional savings other manufacturers are getting with Aluminux, ask your nearby Diversey D-Man. You'll find him an experienced, dependable consultant on your metal finishing problems.

For an interesting illustrated brochure on the Aluminux process, write today to Metal Industries Department, The Diversey Corporation, 1820 Roscoe Street, Chicago 13, Illinois.

For more data circle 191 on Reader Service Card

from The DeVilbiss Company, 300 Phillips Ave., Toledo 1, Ohio.
For more data circle 17 on Reader Service Card

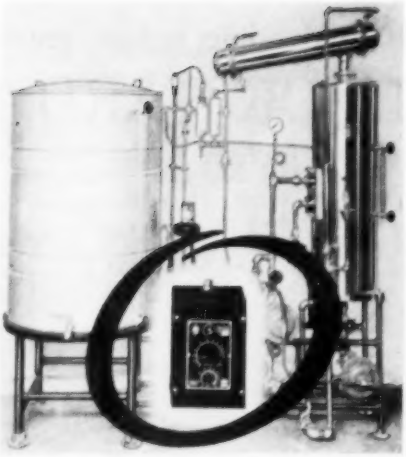
★ ★ ★

Water Purity Controller

The Barnstead Still & Sterilizer Company, 12 Lanesville Terrace, Forest Hills, Boston 31, Mass., has announced the Puromatic Controller, designed to control the purity of distilled water automatically.

Operating on the conductivity principle, the Barnstead Puromatic Controller constantly measures the purity of distilled water coming from a Barnstead Still before it enters storage.

The operator sets the standard of purity required on the control device and only water of that purity or higher is permitted to enter the storage tank. Any water below the pre-set purity required is automatically diverted to waste. The distilled water already accumulating in the storage tank is thus protected from contamination. This continues until the condition which causes the impurities is corrected. The distilled water is then automatically rerouted to the storage tank.



Barnstead Purity Controller maintains preset standard of purity by checking conductivity of distilled water enroute to storage tank

It can also be used with Barnstead's complete line of water demineralizing equipment for protection when the ion-exchange resins become exhausted.
For more data circle 18 on Reader Service Card

★ ★ ★

Rust Inhibitor

A water-soluble chemical inhibitor recently announced by Daubert Chemical Company, 333 N. Michigan Ave., Chicago, Ill., prevents rust on machined parts and stampings following washing, and during temporary in-plant storage.

The rust inhibitor, called Hydrin, is dissolved in the rinse-water, and affords protection during immersion of the metal and following dry-off. The invis-

the original
McAleer
ESTABLISHED 1923
A complete line of
Polishing and Buffing
Compounds in Bar, Tube,
extruded or liquid form.
FREE SAMPLES &
PRICES SUPPLIED
Territories available
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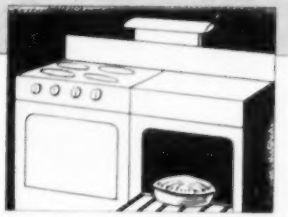
McAleer MANUFACTURING CORP.
101 S WATERMAN DETROIT 17, MICH.
For more data circle 192 on Reader Service Card

DONE TO A TURN

...with Stanley Silicones



When Taylor's new Dial Oven Thermometer needed a coating that would stand up to high oven heat, Stanley chemists cooked up just the right silicone enamel in three bright, fast colors that bat 1.000 in the hot stove league . . . one more example of a Stanley custom finish making a good product better. Maybe your product could profit, too. Why not write us for Free literature, at 31 Berlin St., East Berlin, Conn.

STANLEY CHEMICAL

LACQUERS
SYNTHETICS
VINYLS
ENAMELS

For more data circle 193 on Reader Service Card

ible film remaining permits subsequent machining, painting, or packaging without cleaning.

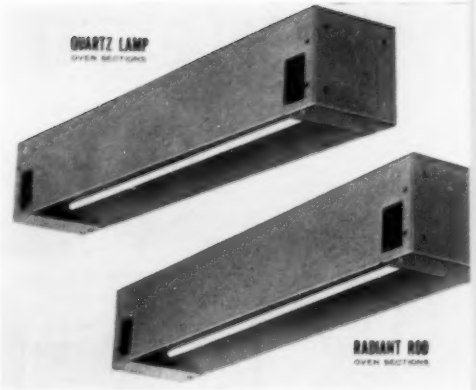
For more data circle **19** on Reader Service Card

★ ★ ★

Radiant Heating Units

A wider range of application is the principal advantage offered by two types of radiant heating equipment introduced by The Fostoria Pressed Steel Corporation, Dept. 422, Fostoria, Ohio.

Fostoria's radiant heating components include: (1) Quartz Lamp Oven Sections, and (2) Radiant Rod Oven Sections, both designed for easy assembly into complete infra-red ovens. The Quartz Lamp equipment was developed by Fostoria to accommodate a source of radiant energy particularly suited to high temperature applications —the T-3 Quartz Lamp, which makes possible product temperatures in excess of 1,000 deg. F.



Fostoria Quartz Lamp Oven Section (top) and Radiant Rod Oven Section form oven walls

The T-3 Quartz Lamp has a high temperature (4,000 deg. F.) tungsten filament. The filament is sealed in an inert gas atmosphere, within a translucent fused quartz shell. This design permits high radiation efficiency. Linear in shape, with metal sealed ends, the T-3 Quartz Lamp has a rated burning life in excess of 5,000 hours.

T-3 Quartz Lamps are moisture-proof, resistant to impact and vibration, and are practically impervious to thermal shock, it is stated. Ideal for many industrial processes including drying, curing, degreasing, baking, and preheating, the Quartz Lamp equipment is especially recommended for high temperature, short cycle applications where instantaneous response is required.

The Radiant Rod equipment, incorporating sheathed metal elements, was developed by Fostoria to serve as an efficient far infra-red unit for industrial applications. Fostoria's Radiant Rod Oven Sections are all metal units which

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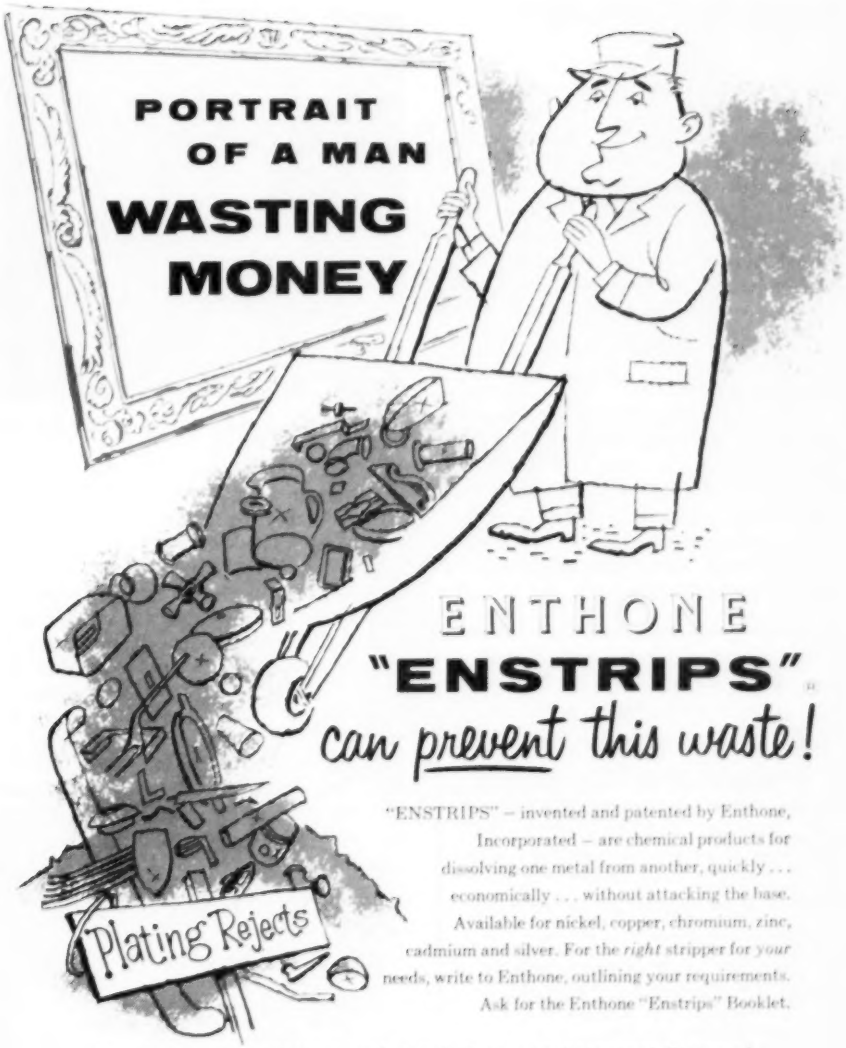

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"ENSTRIPS"

can prevent this waste!

"ENSTRIPS" – invented and patented by Enthone, Incorporated – are chemical products for dissolving one metal from another, quickly . . . economically . . . without attacking the base. Available for nickel, copper, chromium, zinc, cadmium and silver. For the *right* stripper for *your* needs, write to Enthone, outlining your requirements. Ask for the Enthone "Enstrips" Booklet.

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442 ELM STREET, NEW HAVEN 11, CONNECTICUT

Metal Finishing Processes • Electroplating Chemicals

For more data circle **195** on Reader Service Card

can be interlocked to form oven walls of high intensity.

Folders, containing specifications, application data and additional information on Fostoria Quartz Lamp Equipment, Radiant Rod Equipment and Infra-red Equipment may be obtained by writing The Fostoria Pressed Steel Corporation, Fostoria, Ohio.

For more data circle 20 on Reader Service Card

★ ★ ★

String Buffs

A line of string buffs for industrial polishing has been announced by the Schlegel Mfg. Co., Div. P-4, Rochester 7, N. Y. Cotton string section wheels and cotton string cup bobs, or goblet buffs, are available in a selection of popular sizes, or can be made according to specifications.

CASH SAVINGS

with

Koppers New Liquid Potassium Cyanide

1. *You pay only for actual potassium cyanide.*
2. *Purity. Free of all impurities. Less than one part per million.*
3. *Safety. No dangerous cyanide dust to inhale. No exposure to toxic cyanide dust. Accidents are minimized.*
4. *Ease of Handling. No labor involved in dissolving granules. Use from drum to plating tank.*
5. *Service and Experience. Available in tank cars, trucks, and 55 gallon drums. Backed by the technical service of Koppers and Pesco. You can depend on Koppers quality and the same reliable source of supply when you use Liquid Potassium Cyanide.*

Metropolitan Distributor

PESCO PLATING EQUIPMENT CORP.

Plating, Polishing, Grinding, Spraying, Baking, Drying, Tumbling, Cleaning, Degreasing, and Anodizing Equipment—Anodes—Chemicals—Acids—Cyanides—Solvents—Supplies For Wood—Plastics—Metals

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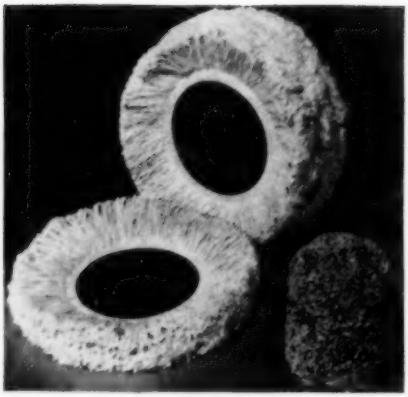
EVERGREEN 4-7472-3-4

For more data circle 196 on Reader Service Card



Schlegel cotton string bob and buff wheels

The buffs are said to offer several production advantages. High quality, long fiber cotton strands are used. As the face of the wheel wears, the ends of the virgin cotton fray into fingers that quickly wipe a mirror finish on metal parts. The section wheels maintain well defined corners, but have a deep pliancy that adapts evenly to irregular surfaces and involved contours. The cotton string buffs are easy to clean, and are particularly recommended for aluminum, brass, silver and soft metal alloys, as well as for chrome and steel. The buffs are said to combine advantages of endurance and gentle surfacing action.

For more data circle 21 on Reader Service Card

★ ★ ★

Germanium Rectifiers

A line of germanium electroplating rectifiers, fully-protected against circuit overloads, has been developed by Wagner Brothers, Inc., Detroit, Mich.

The rectifiers utilize General Electric germanium "Safety Cells," hermetically-sealed to protect the germanium wafers from attack by moisture and corrosive fumes.

Basic stacks consist of six germanium cells, each with cooling fins. The

Hisey *makes both!*

V BELT DRIVE

DIRECT DRIVE

BUFFERS & POLISHERS

DUST COLLECTORS *also*
Bag Type (as shown)
and Cyclone Type

Our pride in having developed the first V Belt Buffer has not blinded us to the fact that there is still a place for direct driven machines. HISEY makes both—in a large variety and range of sizes from ¼ to 50 H.P., and both are made to the same high standard of quality built-in HISEY tools since 1896.

Catalog No. 72FA on request

Hisey THE HISEY-WOLF MACHINE CO.
CINCINNATI 8, OHIO
Division of The Cincinnati Electrical Tool Co.

For more data circle 197 on Reader Service Card

stacks are of a standard design, are interchangeable, and are rated at approximately 500 amperes each.

Every germanium cell is individually protected against circuit fault conditions and sudden overloads by fuses.

All units are forced air cooled with a centrifugal blower. The 3-phase blower motor is provided with a separate magnetic starter to guard against overloads. The unit is further protected from the build-up of destructive temperatures due to blower failure by a "pressure switch."

In addition to individually-fused germanium cells, the Wagner Brothers' Germanium Rectifier is protected against single phasing on the 3-phase circuit. The main magnetic starter is provided with a thermal breaker.

For Platers, Silversmiths, Jewelry Mfgrs., Makers of Watches, Clocks and Electronics and other metal finishers.

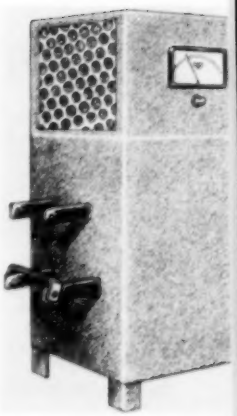
Supplied in straight or crimped brass, steel, nickel silver or stainless steel wire in sizes .0025 to .006 and in bristle, fibre or Nylon. Special sizes and shapes to order.

Write (Dep't. P) on your letterhead for catalog and price list.

DIXON & RIPPEL, INC. Box 116 Saugerties, N. Y.
ESTABLISHED 1856

For more data circle 198 on Reader Service Card

Efficiencies as high as 95 per cent are possible, depending upon current and voltage, and these units will operate indefinitely at up to 150 per cent of rated current, the manufacturer states. A voltage range from 6 to 48 volts, with current output up to 50,000 amperes, will accommodate most metal finishing needs.



Wagner Brothers Germanium Rectifier

The germanium rectifiers are provided with any popular type of automatic or manual control: tap switch, powerstat, remote saturable reactor, and so on. These controls can be situated either integrally on the rectifier cabinet or as a remote control at any location within the plant.

The units are available in two basic cabinet sizes: 28 by 28 by 64 inches for up to 3,000 amperes, and 28 by 54 by 64 inches for units with capacities from 4,000 to 6,000 amperes.

Technical product information bulletins are available by writing Wagner Brothers, Inc., 432 Midland Ave., Detroit 3, Michigan.

For more data circle **22** on Reader Service Card

★ ★ ★

Non-Sanding Primer

An automotive undercoat, "Satin Prime," a light gray non-sanding primer sealer, has been developed by Ditzler Color Division of Pittsburgh Plate Glass Company, 632 Fort Duquesne Blvd., Pittsburgh 22, Pa.

Said to possess exceptional adhesion over steel or aluminum, the product may also be used over old lacquer or

A NEW NORTHWEST STAR!

Northwest 449 water soluble compound replaces powder and liquid combinations . . . eliminates metal cleaning hazards and disposal problems. Harmless and SAFE to use, yet remarkably efficient for preparing non-ferrous metallic surfaces for plating and finishing. Has long bath life . . . costs no more than ordinary cleaners. *Get our expert analysis of YOUR job by calling or writing us today.*

For more data circle **199** on Reader Service Card

enamel. Lacquer or enamel may be applied over Satin Prime after fifteen minutes flash dry.

For passenger car work the product is recommended as a primer-sealer or ground coat under pastel colors. It also holds down fresh enamel on new cars in two-toning operation.

Fast drying, quick recoating, good adhesion and excellent color holdout are other advantages of this primer.

For more data circle **23** on Reader Service Card

★ ★ ★

Backstand Idler

Model BS backstand idler, recently introduced by the Curtis Machine Corporation, Jamestown, N. Y., incorporates a foot pedal for belt tension release, leaving both hands free for changing the belt.

Available for use with 4, 6, or 8-inch belts, the unit is designed to be used with any grinding or polishing lathe.

Positive belt control is assured by the adjustable spring loaded belt tension and accurate tracking control.

It can be floor, pedestal or wall mounted without the use of adapters for operations on either the right or left side of polishing lathes. Belt speeds of 5,600 to 7,500 s.f.p.m. are possible with a single speed 1,800 r.p.m. lathe.

Remote tracking and pneumatic tensioning are available as optional equipment. Complete information is available in Bulletin A1381, available from the manufacturer.

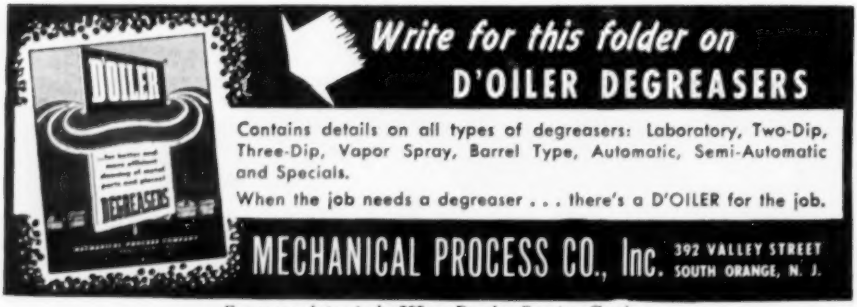
Curtis Machine Backstand has foot pedal for belt tension release, leaving hands free

For more data circle **24** on Reader Service Card

★ ★ ★

Stainless Steel Materials Handling Basket

The Chas. Wm. Doepke Mfg. Co., Inc., 8898 Blue Ash Rd., Rossmoyne, Ohio, has announced the availability of a NesTier perforated stainless steel


D'OILER
DEGREASERS
Write for this folder on
D'OILER DEGREASERS
Contains details on all types of degreasers: Laboratory, Two-Dip, Three-Dip, Vapor Spray, Barrel Type, Automatic, Semi-Automatic and Specials.
When the job needs a degreaser . . . there's a D'OILER for the job.
MECHANICAL PROCESS CO., Inc.
392 VALLEY STREET
SOUTH ORANGE, N. J.

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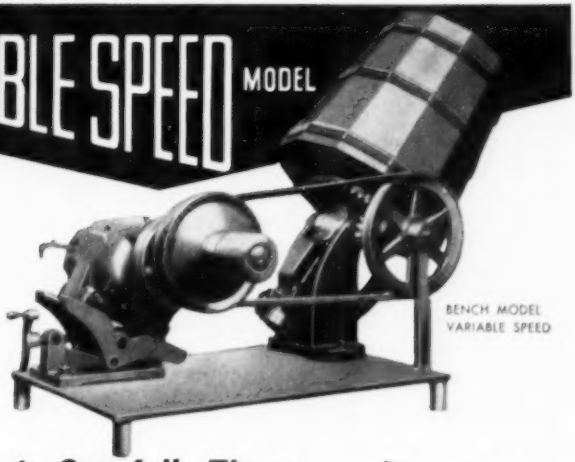
INVESTIGATE THIS TIME-SAVING

VARIABLE SPEED MODEL



BENCH MODEL VARIABLE SPEED

Bench-Type Single Speed

No. 5—Single Speed

No. 5A—Single Speed

No. 6—Single Speed

Note Carefully These IMPORTANT POINTS

Barrels can be filled with parts or abrasive — *while running.*

Work can be watched — samples removed for inspection — *while running.*

Angle can be changed for best abrasive or polishing action — *while running.*

Barrels can be emptied by tilting to pouring position — *while running.*

Barrels are made in various sizes, shapes, and materials. They are easily replaced.

No. 5—Variable Speed

No. 5A—Variable Speed

No. 6—Variable Speed

If You're a Tumbler, Send for This NEW CATALOG

THE HENDERSON BROS. COMPANY

"The Tumbling Barrel People"

134 SOUTH LEONARD STREET
WATERBURY, CONNECTICUT

SINCE 1880 DESIGNERS AND BUILDERS OF TUMBLING BARREL EQUIPMENT

For more data circle 201 on Reader Service Card

basket which combines strength and rigidity with rapid draining and easy cleaning features.

Of all-welded, die-made construction, the basket is available in five different sizes, ranging from 12 to 36 inches in length. The units can be supplied in various types of stainless steel as well as in aluminum or steel. A variety of perforation sizes is offered.

Design of the NesTier perforated basket permits handling parts or products throughout all production operations in the same container.

When filled, NesTier baskets tier in rigid stacks, with contents of each unit fully visible and accessible through double hopper ends. Empty baskets nest, saving floor space. Design of these baskets ensures easy separation of nested units, eliminating sticking.

NesTier baskets can be used in conjunction with powered belt, overhead, wheel and roller conveyors. Large unit loads can be tiered on skids or pallets for transporting by powered or hand lift trucks.

For more data circle 25 on Reader Service Card

Doepke NesTier Materials Handling Baskets

★ ★ ★

Industrial Fans

The Dracco Corporation, Harvard Ave. at E. 116th St., Cleveland, Ohio, has announced the availability of industrial fans formerly produced only as components of Dracco Dust Control systems.

Dracco standard design fans are said to provide dependable service in many operations involving gases or air-entrained materials. Additional specialized fans are available for conveying explosives, gases up to 800 deg. F., or materials of a corrosive nature. A wide variety of sizes may be obtained: inlet diameters from 11 to 38 inches, pressures to 17 inches S.P., and capacities from 500 to 46,000 c.f.m.

Among the advantages of Dracco Industrial Fans are easy removal of the wheel from the housing for cleaning; careful static and dynamic balancing

Randolph

EXPERIENCE and RESEARCH MEAN

BETTER FINISHES for your products

LACQUERS • ENAMELS
DOPES • THINNERS
CLEAR METAL FINISHES
COLORED LACQUERS
CLEAR S.G. FOR METAL
TEXTURE ENAMELS
SPECIALIZED PRODUCTION FINISHES
AIRCRAFT FINISHES

Depend on us for Prompt Delivery

RANDOLPH PRODUCTS CO.
CARLSTADT, N. J.

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For RAPID STOCK REMOVAL

NATIONAL MODEL 400

Orbital Action Sanding

National's Model 400 Orbital Action Sander is made for tough operation on production lines. Properly used, it will cut sanding time as much as 75% . . . reduce operator fatigue . . . and produce a better finish. Over 100,000 Model 400 Sanders are now in operation in industries throughout the world.

NATIONAL SANDERS

National makes a complete line of block sanders with either orbital or straight line action . . . air or electric driven. Write for more information today.

Pioneers in the Manufacture of Orbital Action Sanders

NATIONAL AIR SANDER, INC.
2818 AUBURN ST., ROCKFORD, ILLINOIS

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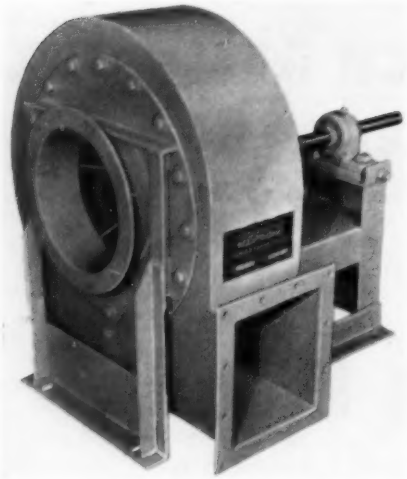


Industrial Fan: Capacities, 500-46,000 c.f.m.

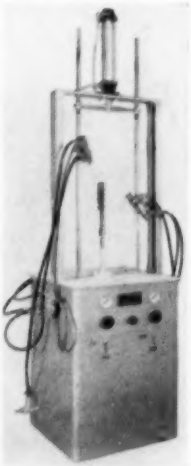
of the wheel; heavy-duty self-aligning pillow block bearings permitting placing of the unit on a side wall or ceiling; high carbon steel shaft ground to exact specifications; and a variety of drive arrangements.

Additional features of these fans include heavy gauge welded steel construction with extra reinforcement to reduce vibration in larger fans.

For more data circle **26** on Reader Service Card

Automatic Spray Painter

An automatic machine especially designed for spray painting cylindrical and rectangular parts such as tubes, bottles, model trains, statuettes and toys, has been developed by Conforming Matrix Corporation.



Conforming Matrix Automatic Spray Painting Machine

This machine has vertical traveling guns which can spray either on the downstroke or on both the down and upstroke, and a rotating spindle workholder which can also be set stationary.

The machine, Model SS2GVT is completely air operated, and has a low-pressure hydraulic cylinder drive for smooth gun travel. The speed of gun travel is fully adjustable in both directions. A spindle stopping-locating device facilitates easy loading and unloading of work.

The speed of spindle rotation is adjustable from 50 to 400 r.p.m. by a dial

METABOND

MEANS *PROGRESS* IN RUSTPROOFING

METABOND is the only effective immersion or spray amorphous type zinc coating in the industry today.

METABOND withstands severe and consistent flexing and bending without chipping or breaking bond.

INTERNATIONAL RUSTPROOF CORPORATION

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MANUFACTURERS OF RUST PREVENTIVES AND CORROSIVE SOLVENTS

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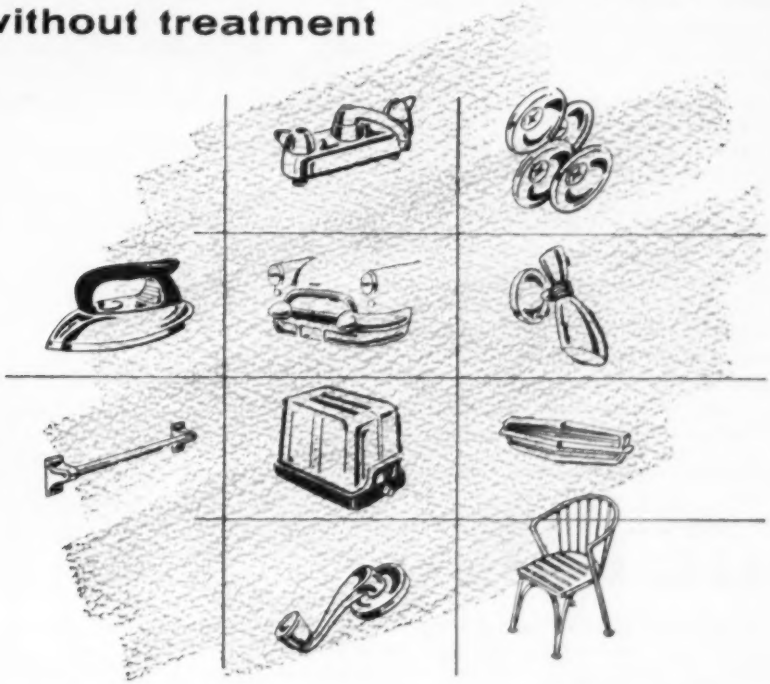
HARSHAW Nubrite

Long, bright nickel plating operation without treatment



Other outstanding advantages are:

BRIGHT OVER WIDE RANGE
from a few amperes/ft.^{2}
to well over 100 amperes/ft.^{2}

HIGH TOLERANCE to common impurities

HIGHLY RECEPTIVE to chrome

EXCELLENT LEVELING

BETTER BRIGHTNESS with thinner deposits.

SIMPLE OPERATION and CONTROL
Plates brightly from 120°F to 155°F.
pH can vary over a wide range.
Liquid addition agents.

REMAINS DUCTILE AFTER LONG OPERATION

For additional information contact the Harshaw office nearest you.

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For more data circle 205 on Reader Service Card

on the face of the unit's front panel.

The unit is equipped with two automatic spray guns, speed controls, atomizing air regulator, necessary hoses and connections. The air operated valves and other moving parts are automatically oiled.

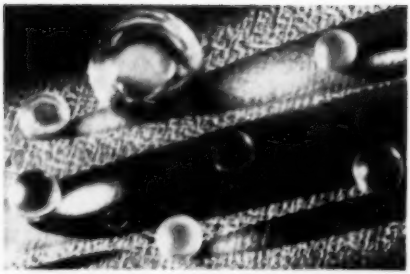
Free literature is available from Conforming Matrix Corp., 356 Toledo Factories Building, Toledo 2, Ohio.

For more data circle 27 on Reader Service Card

★ ★ ★

Pyrex Balls

The Hartford Steel Ball Company, Inc., 14 Jefferson Ave., West Hartford 6, Conn., is now producing precision ground Pyrex Glass Balls. Non-conductive and unaffected by heat and cold, they offer a wide application where resistance to a variety of corrosives is necessary. They are light in weight, heat and shock resistant and have a high load capacity.



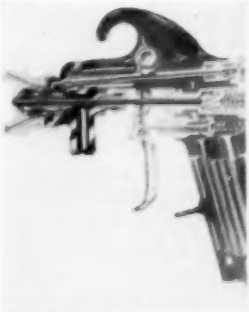
Hartford Precision Ground Pyrex Glass Balls

For more data circle 28 on Reader Service Card

★ ★ ★

Stainless Steel Spray Gun

A spray gun equipped with stainless steel head, nozzle, and fluid needle has been announced by Binks Mfg. Co., 3118-40 Carroll Ave., Chicago 12, Ill. Stainless steel at these points adds service life to spray guns used in applying corrosive fluids like latex and mild acid solutions.



A Spray Gun for Corrosive Fluids

The spraying of fluids such as animal and vegetable oils, which might be contaminated by the metals used in standard spray guns, is also made practical by Model 18SS, the manufacturer states.

A stainless steel gun, designated Model 18VSS is available with tungsten carbide reinforcement on the needle valve and nozzle. The combina-

TRUE BRITE BRASS SOLUTION

A foolproof solution which has been in use over 6 years in light and heavy production.

- Ready To Use—Just Add Water
- No Variance in Color
- Trouble-Free—Little Supervision Needed
- Low Cost—Additions only once a day

Available in a variety of colors. Will match your sample.

Write for technical bulletin and prices.

TRUE BRITE CHEMICAL PRODUCTS CO.
Box 31, Oakville, Conn.

For more data circle 206 on Reader Service Card

Look to Wyandotte for lower metal-finishing costs, complete service

Wyandotte offers you the complete line of cost-cutting industrial chemical products to improve the quality of your metal-finishing operations.

In addition, Wyandotte provides prompt, accurate, and thorough technical service through trained representatives. This service, together with warehouse stocks, is available from coast to coast.

We can accurately **survey** and **analyze** all your specialized chemical-finishing operations. Let us help you — no obligation. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, California. Offices in principal cities.*

• Wyandotte's complete line of products for metal finishing:

★ **Buffing Compound Removers.** MERSOCLEAN-540 process for all metals.

★ **Electrocleaners.** Anodic and Cathodic — for steel, copper, brass, zinc die castings, nickel, and other metals: F.S.,* B.N., C.S.R.,* LECTRITE-NF.

★ **Soak Cleaners.** Complete line for the electroplating, vitreous enameling, and painting industries: W.L.G.,* ALTREX,* No. 11 CLEANER, RUVAT.

★ **Barrel-Finishing Compounds.** De-burring and burnishing types for steel, stainless steel, brass, zinc die castings, aluminum, and copper.

★ **Washing-Machine Cleaners.** Alkaline and emulsion types, for spray and rotary machines: EXPRAY-AP, INDUSTRIAL 38, NORDALL,* EMILON.*

★ **Paint Removers.** Alkaline and solvent types, for all finishes on all metals.

★ **Paint-Preparation Products.** Cleaning and phosphating processes: PRE-FOS,* PHOS-IT.*

★ **Paint-Department Maintenance.** Water-wash compounds, dry-wall compounds, booth-cleanout compounds.

★ **Rust and Scale Removers.**

★ **Aluminum-Specialty Products.** Etchants, de-smutting compounds, preparation for spot welding, brighteners.

★ **Rust Preventatives.** R-2, NORDALL.*

★ **Neutralizers.** For pickling and vitreous-enameling lines.

*REG. U.S. PAT. OFF.

Wyandotte CHEMICALS

J. B. FORD DIVISION

"The Best in Chemical Products for Metal Finishing"

For more data circle 207 on Reader Service Card

DAYCO HAMMER FINISHES

For uniformity of pattern, depth of gloss, permanency, toughness, chip resistance; all features that help to make sales and build a quality reputation for your products, specify DAYCO baking or air dry Hammer finish.

Backed by half a century of "know how", Dayco finishes have a quality reputation you can depend upon. We have, or will produce for you, the special finishes your production calls for.

- Clear and colored Lacquers
- Primers
- Surfacers
- Baking Enamels
- Handle Finishes
- Removers
- Screening Materials (Lacquers—Vinyls—Synthetics)
- Undercoats

Fiftieth Anniversary
1906 1956

JAMES B. DAY & COMPANY

1872 Clybourn Ave. . . Chicago 14, Illinois

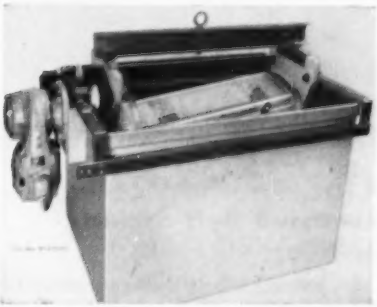
tion of these hard metals in the fluid ejection parts of the Model 18VSS provides a more corrosion-resistant spray gun for applying vitreous enamel.
For more data circle 29 on Reader Service Card

★ ★ ★

Oscillating Plating Barrel Cylinder

A double oscillating plating barrel cylinder has been announced by the Belke Manufacturing Company, 947 N. Cicero Ave., Chicago 51, Ill.

The cylinder is eccentrically mounted. The ends move up and down in opposite directions, tilting the cylinder back and forth as it rotates. The work



Double Oscillating Plating Barrel Cylinder

flows away from the high end toward the low and then reverses and flows back as the cylinder tilt reverses. Thus all surfaces are more uniformly exposed and no work remains shielded by cylinder ends.

The added end-to-end motion also helps separate washers and other parts that tend to stick together.

This type barrel is available in all sizes from 14 by 30 to the small 6 by 12 cylinders used in portable platers.
For more data circle 30 on Reader Service Card

Aerosol Rust Preventive

Krylon "Rust Veto" prevents corrosion

"Rust Veto" spray, to protect all metals from corrosion by the pressure of a finger, has been announced by Krylon, Inc., Ford & Washington Sts., Norristown, Pa.

Krylon Rust Veto spray in aerosol dispensers is being marketed by Krylon, Inc., under exclusive license from E. F. Houghton & Co.

Krylon Rust Veto is effective on all types of metals, both ferrous and non-ferrous. Finger pressure releases a fine, even spray which forms a soft, dry and waxy film that resists oxidation.

The product can protect such items as dies, tools, polished steel, critical surfaces on important machines and equipment, sporting goods, hardware, bicycles, garden and farm equipment.
For more data circle 31 on Reader Service Card

★ ★ ★

Ultrasonic Transducer

The General Ultrasonics Company, 1240 Main St., Hartford, Conn., has announced an ultrasonic transducer for cleaning, degreasing, pickling and plating. The type T-2 Sonicell is completely sealed, metal jacketed, stainless steel lined and thermostatically protected.

Its stainless steel treatment chamber permits use of a wide variety of process liquids. Provision is made for draining and recirculating process liquids during operation.

The type T-2 Sonicell treatment

← For more data on advertisement on opposite page circle 208 on Reader Service Card

Load of metal parts being removed from a stainless steel ultrasonic treatment chamber

chamber is 20 by 8 by 6 inches with a liquid capacity of 2½ gallons.

Resonant frequency of 20 kc./sec. provided by the transducer provides maximum cavitation energy above the range of human audible perception. It is powered by General Ultrasonic's Model 400 Ultrasonic Generator, which is continually variable in frequency from 10 kc. to 1200 kc. with an output of 400 watts.

For more data circle 32 on Reader Service Card

★ ★ ★

Wire Baskets

The Chas. Wm. Doepke Mfg. Co., Inc., 8898 Blue Ash Rd., Rossmoyne, Ohio, has announced the addition of wire baskets to its NesTier line of parts handling equipment. Number of standard sizes offered ranges from 18 by 10 by 3 inches to 24 by 14 by 12 inches. In addition, facilities are available for fast, economical design and production of special baskets and inserts to meet individual requirements.

Particularly adapted for handling fragile or highly finished parts, NesTier wire baskets are also recommended for use when parts within a container need to be positioned for easy withdrawal for production or assembly operations.

NesTier Wire Parts Handling Baskets

For more data circle 33 on Reader Service Card

★ ★ ★

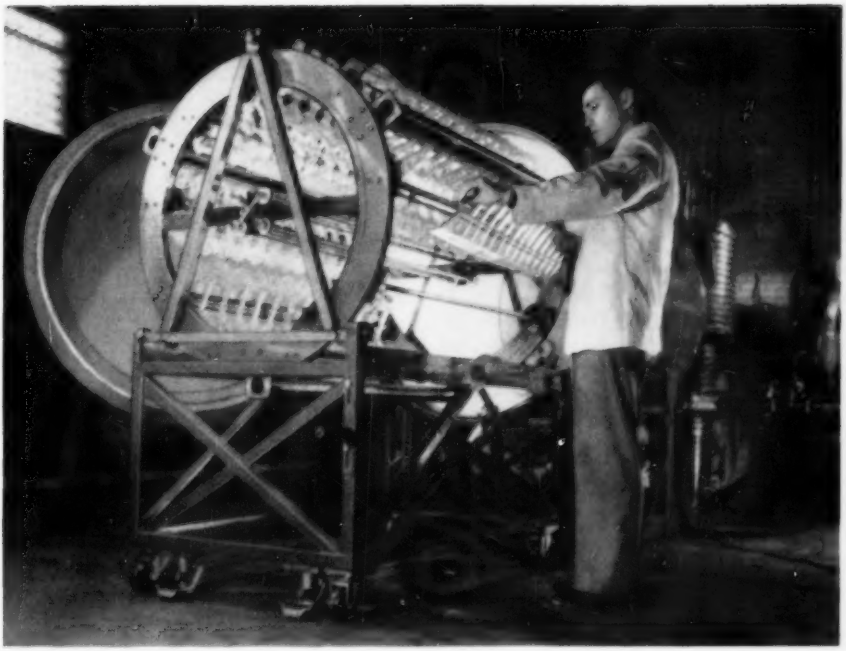
Abrasive Belt Swing Grinder

An abrasive belt swing grinder that will swivel 75 degrees clockwise and 150 degrees counter clockwise from the operator's position has been announced by the Abrasive Machinery Corp., 432 S. Pennsylvania St., Indianapolis 25, Indiana.

The suspension may be moved laterally or longitudinally to maintain perfect balance. Belt tracking, hand knob and electrical controls are located close to the operator.

This belt grinder can be used as a standard swing belt grinder. It also has a lathe mounting for mounting off the back cross slide for polishing of cylindrical parts.

For more data circle 209 on Reader Service Card



How to get new business with a new process . . . *vacuum metallizing*

Add vacuum metallizing to the services you render to customers, and you'll brighten your products *and* your profits at the same time.

Perhaps you'll even have the key to the doors of new customers.

Vacuum metallizing is an economical way to give color and high-quality finish to plastics, metals, glass and other materials.

Using lacquers and various metals (low-cost aluminum is one of the best), you can offer an almost infinite number of rich-looking colors and finishes—all beautifully highlighted by a mirror-like backing.

Vacuum metallizing is an easy operation. Average personnel can become expert coaters in a few hours.

There are a variety of *CVC* machines to fit your budget and needs:

For mass production—For coating large pieces and mass coating medium- and small-sized pieces, we recommend the 48" coater shown above. With this coater you can metallize from hundreds to thousands of pieces per cycle—depending upon the type and size of material being coated. You can run 3 to 6 complete process cycles per hour.

For medium quantities—The 30" coater is more economical for medium quantity runs. The specific amount that can be metallized per cycle again depends upon type and size of material. You can easily attain 5 to 7 cycles per hour.

For optics, lab and pilot plant—Small coaters are available for production coating of optics and other small parts, and for laboratory and pilot plant work.

Literature and help—Before you decide on any coater, send for technical data on the complete *CVC* line. One of our sales engineers will be glad to help you decide which type and size best meets your needs.

CVC **Consolidated Vacuum, Rochester 3, N. Y.**

a division of CONSOLIDATED ELECTRODYNAMICS CORPORATION, *Pasadena, California*

Sales Offices: Albuquerque • Atlanta • Boston • Buffalo • Chicago • Dallas • Detroit • New York • Pasadena • Philadelphia • San Francisco • Seattle • Washington, D. C.

For more data circle 210 on Reader Service Card

The Universal Abrasive Belt Swing Grinder

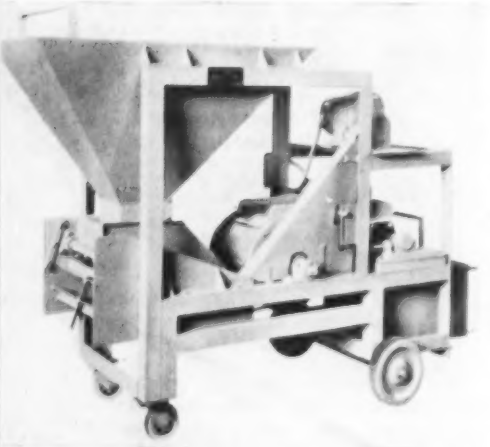
The Universal Belt Grinder may be bench mounted for contact wheel grinding and for contour polishing. Or it may be equipped with a platen for flat polishing and slack belt polishing.
For more data circle **34** on Reader Service Card

★ ★ ★

Magnetic Parts Separator

Stearns Magnetic, Inc., Milwaukee 46, Wisconsin, has developed a mobile magnetic parts separator, designed to separate parts from deburring chips and stones.

The automatic unit will separate seven cubic feet of parts and chips in 10 minutes. Equipped with a demagnetizer, the completely self-contained separator eliminates time-consuming hand separation.
For more data circle **35** on Reader Service Card



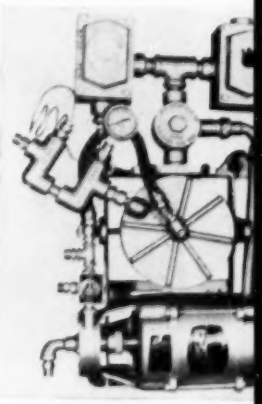
Stearns mobile magnetic parts separator

★ ★ ★

Hot Spray Temperature Control

The Viscomatic, an external dial temperature controller for hot spray heaters, has been introduced by the Spee-Flo Co., Houston, Texas.

Any desired temperature in the 90 to 170 deg. F. temperature range can be dialed externally. An accurate sensing element reads fluid temperature and controls it within plus or minus two degrees.



Spee-Flo Hot Spray Heater with Viscomatic Temperature Controller (top, left)

The Viscomatic is explosion proof and is factory installed with the required heater.

Temperature variation from 150 to 170 deg. F. produces little or no viscosity change. At levels below 150 deg. F., however, temperature changes cause marked differences in viscosity. The Viscomatic offers precision control at any level, the manufacturer states.

This equipment is particularly advantageous on wrinkle finishes, heat sensitive varnishes, and hammertones.

A free booklet, "Why Hot Spray?" is available from the Spee-Flo Co., Dept. PF-9, 720 Polk, Houston, Texas.
For more data circle **36** on Reader Service Card

3 STANDARD SHAPES

"RECTANGULAR"

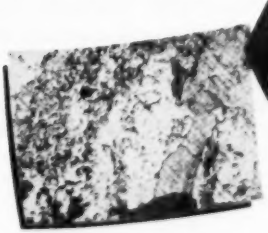
"TEAR DROP"

"DOG BONE"

NEW!

SHAPED, EXTRUDED APW SILVER ANODES

CONTROLLED GRAIN SIZE: APW EXTRUSION PROCESS* controls grain size within definite limits—minimizes sheddings



ROLLED FLAT PLATE ANODE SECTION. Photomicrograph illustrates highly irregular, uncontrolled grain size—a major cause of shedding and rough electrodeposits

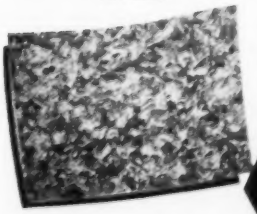
*Pat Pending

The three standard shapes of APW Extruded Anodes were developed to extend the useful life of anodes—*to lower plating costs!*

Through scientific design, the distribution of mass material helps to maintain a more efficient ratio between anode weight and active surface area. After 85% by weight has been plated off, this APW anode *retains 80% of its original active surface area!* You profit three ways with longer anode life, minimized polarization and less silver scrap to be refined.

Another equally important advantage of the new APW Extruded Anode is the small, uniform grain size—*controlled between definite ideal limits!* As a result, corrosion is smooth and uniform for consistently smooth electrodeposits. Shedding is virtually eliminated—rejects are a comparative rarity!

To be certain the silver you buy in anodes is used most efficiently, APW will develop special anode shapes to meet particular plating bath conditions. We'll be glad to assist with your anode problems.



APW EXTRUDED ANODE SECTION. Note small, fully controlled regularity of grain size to promote uniform corrosion, smoothest electrodeposits and less rejects

THE AMERICAN PLATINUM WORKS

231 NEW JERSEY RAILROAD AVENUE • NEWARK 5, NEW JERSEY

APW

ENGELHARD INDUSTRIES

For more data circle 211 on Reader Service Card

Dust Collectors with Casters

All Torit dust collectors of both the cabinet and cyclone type are now available with casters as optional equipment, according to an announcement recently made by Torit Manufacturing Co., Dept. KP, 287 Walnut St., St. Paul 2, Minn., designers and builders of individual collectors for dust, particles and fumes.

Even though the units can now be moved from one location in the plant to another for intermittent use on particle, powder, fume, and dust creating equipment, the addition of casters will permit the collectors to be moved more easily than previously possible.

The casters are made of hard rubber, 3 inches in diameter and 1 inch wide for smooth rolling. Two of the casters in each set are provided with locks, and all are welded to the bottom of each unit at the factory.

Dust Collector Equipped with Casters

Seventeen Torit dust collectors and their adaptations are affected by the development of this accessory, ranging from the 160 pound Model 54 to the 1130 pound Model 122, although they will undoubtedly prove more popular for the smaller machines in the line.

For more data circle **37** on Reader Service Card

★ ★ ★

Ultrasonic Degreaser

An ultrasonic degreaser designed for rapid cleaning of fabricated parts in

TUMBLING CHIPS

PROCESSED LIMESTONE HONING CHIPS are excellent for producing a super fine finish on non-ferrous metals.

PROCESSED RED GRANITE ABRASIVE CHIPS are exceptionally well suited for developing a fast cut on ferrous metals.

CHIPS IN 16 SIZES

FREE CATALOG AND CHIP SAMPLES FOR COMPARISON.

SAMPLE PARTS PROCESSED
Write or Call
VE 8-2071

UNIVERSAL TUMBLING SUPPLY CO.
14337 Mansfield **Detroit 27, Mich.**

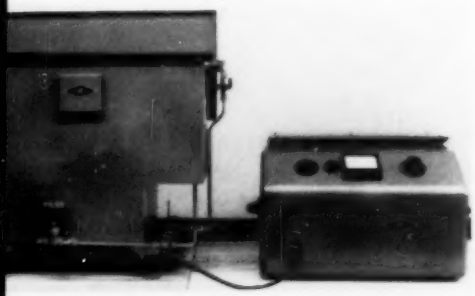
For more data circle **212** on Reader Service Card

SOLVENTS and THINNERS RECOVERED

from wash thinners, spoiled lacquers, degreasing machine sludge, etc.
Solvents recovered by the Lofgren Process. Each customer's shipment, whether one drum or a carload, receives proper and separate treatment. *Write to:*

Solvents Recovery Service, Inc.
1025 Broad St. **Newark 2, New Jersey**
Hammond Solvents Recovery Service
241 Brunswick Rd. **Hammond, Ind.**

For more data circle **213** on Reader Service Card



Curtiss-Wright Ultrasonic Vapor Degreaser

preparation for finishing or assembly has been announced by the Industrial and Scientific Products Division of Curtiss-Wright Corp., Caldwell, N. J.

The unit is 24 by 10 by 18 inches and can accommodate workpieces 8 by 8 by 10 inches. Two cleaning stages are featured—vapor degreasing and ultrasonic solvent cleaning, usable in the order desired. Solvents such as trichlorethylene can be used.

Built-in components of the degreaser consist of pump, filter, solvent spray, heater, thermostats, and condenser.

Ultrasonic power up to 500 watts at 40 kilocycles frequency is available over an area of 7 by 9 inches. The generator is housed in a separate unit. The entire equipment operates from a 110 volt 60 cycle power line, and consumes approximately 2,500 watts maximum.

For more data circle **38** on Reader Service Card

★ ★ ★

Laminated Wood Tanks

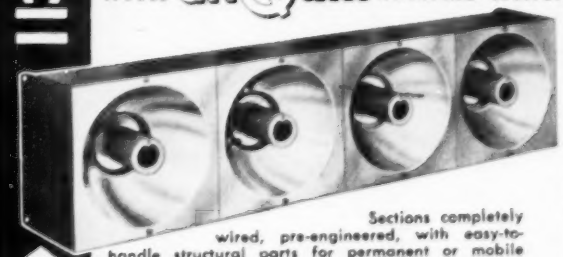
Wood Tanks have been used for pickling in the metal working industry for many years, because wood is resistant to acid solutions.

To meet the requirements for wood tanks that would not be subject to excessive shrinkage caused by acid solutions, and for proper strength in excep-

Ovens Any Size or Shape

YOU CAN *do it yourself* EASILY

BUILD YOUR OWN OVENS OR HEATING UNITS WITH driQuik INTERLOCKING INFRA-RED SECTIONS.



Sections completely wired, pre-engineered, with easy-to-handle structural parts for permanent or mobile ovens. If you prefer, we will build ovens or panels for your needs. No bulbs or sockets to burn out. Immune to damage by vibration, moisture.

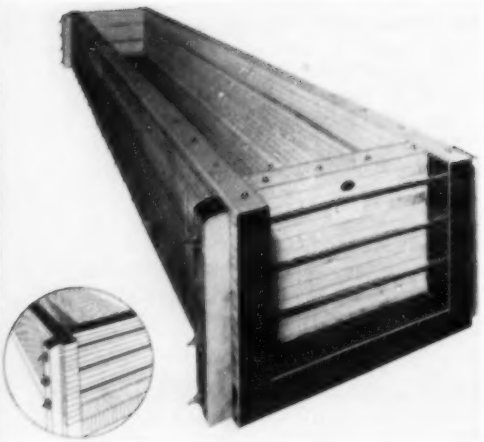
WRITE FOR LITERATURE

Showing how you can speed up production and reduce costs in heating, baking, curing, dehydrating, degreasing, and other applications with driQuick exclusive lava-coated sections. Only driQuick has Ceramic infra-red generators.

driQuik DIVISION

DRY CLIME LAMP CORP. Greensburg, Ind.

For more data circle **214** on Reader Service Card



Wendnagel Laminated Wood Pickling Tank

tionally long tanks, Wendnagel & Co., Inc., 600 W. Cermak Rd., Chicago 30, Ill., has announced a laminated construction.

This construction allows the use of Tank Grade lumber three and four inches thick. Boards of this thickness can be thoroughly air dried and bolted together to form a tank of the shape usually employed for pickling. This construction permits the building of wood tanks to almost any size required.

For more data circle 39 on Reader Service Card

PAINT MIXER

MIRACLE PAINT REJUVENATOR

All paint restored to original consistency without opening the can.
2 minutes per gallon.

MIXERS AVAILABLE
¼ PT. to 55 GALS.

MIRACLE PAINT REJUVENATOR COMPANY
127 E. 9th St., St. Paul 1, Minn.

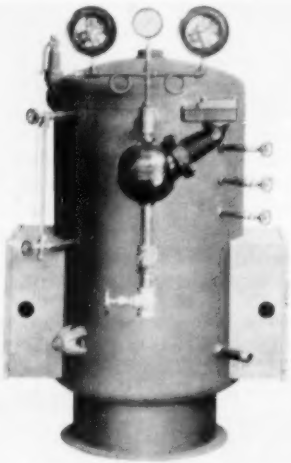
5 GAL. MODEL

For more data circle 215 on Reader Service Card

Steam Boilers

A line of electrically heated steam boilers has been introduced by Commonwealth Electric & Mfg. Co., 83-105 Boston St., Boston 25, Mass. These boilers are designed especially for producing process steam.

Chromalox electric immersion heaters are used as the heating units in these boilers. Provision is made for later additions of greater capacity by designing the boiler so that more or larger immersion heaters can be added as they are needed.



Comm-o-lectric Electrically Heated Boiler

All models have automatic pressure controls, including magnetic contactors, fully adjustable. Models are available with from 1 to 39.6 h.p., producing from 30 to 1,180 pounds of steam per hour.

For more data circle 40 on Reader Service Card

★ ★ ★

Strippable Coating

I-Sis 88, a clear, sprayable solvent based liquid that is used to produce a

temporary protective film is a product of I-Sis Chemicals, Inc., Springdale, Connecticut.

I-Sis 88 sprays easily, is not subject to blushing even under humid conditions and levels to form a smooth continuous film. Spraying pressure of 35 pounds is suggested. Wet films should be allowed to set for about five minutes before force drying. I-Sis 88 also may be air dried. If this method is used the object should be allowed to dry overnight before packaging.

The product exhibits wide latitude in drying conditions, since comparable properties were observed in air dried and baked films. Variations in baking conditions do not seem to affect the ease of stripping the coating.

The dry film has good adhesion. It is difficult to get through the film even with a coin or metal object. Film clarity is excellent.

Cold water sensivity and heat sensitivity are low. Continuous exposure to 120 deg. F. under humid conditions for 24 hours showed very little increase in tack while hot and no film deterioration on cooling. Continued exposure to cold water has little effect, if the film is not mechanically disturbed. When the coated object is dried, the original film properties are restored. Therefore, prolonged storage in southern climates (and flood damage) should have little effect on articles coated with I-Sis 88 strippable coating.

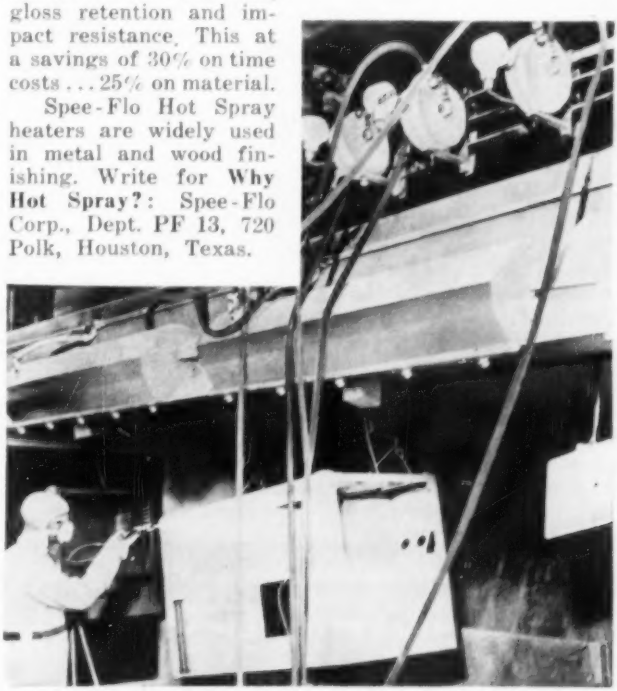
Stripping of the coating is accomplished in either of two ways:

1. By allowing hot water (115 deg. F.) to run over the object at a fair velocity for 20 seconds, until the article is heated and wet, then breaking the

Higher Quality finish, lower cost

Finishing department rejects due to small changes in temperature, humidity and paint viscosity were high until Ben Hur Mfg. Co., Milwaukee, installed hot spray heaters on the food freezer line 2 years ago. Result: not only were rejects cut 65%, but the hot spray coat showed better adhesion, gloss retention and impact resistance. This at a savings of 30% on time costs . . . 25% on material.

Spee-Flo Hot Spray heaters are widely used in metal and wood finishing. Write for **Why Hot Spray?**: Spee-Flo Corp., Dept. PF 13, 720 Polk, Houston, Texas.



For more data circle **216** on Reader Service Card

finish with the fingernail or pressure from the thumb or some hard object. The stream of water should be directed at this point and in a few seconds, a water bubble will form between the metal and the film and increase in size as it lifts the film. The unusual cohesion or film strength of this product makes it possible to remove the coating in sheet form rather than small peelings.

2. The second method of removal is to immerse in hot water for approximately 2 minutes and then initiate by a scratch. While in clear water, it is easy to peel the surface coating in strips. No detergents, soaps or additives are necessary to effect easy stripping. The film will not char on direct flame exposure.

For more data circle **41** on Reader Service Card

★ ★ ★

All-Purpose Absorbent

An industrial floor absorbent said to soak up more than its own weight in oil, greases and other fluids has been developed by the Diversey Corporation, Absorbents Dept., 1820 Roscoe St., Chicago 13, Illinois.

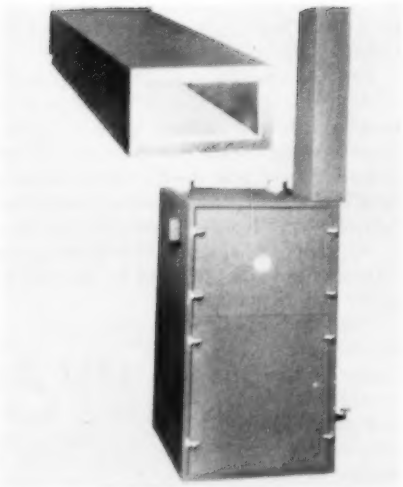
Called "Pickup," this all-purpose absorbent's low density per cubic foot provides greater floor coverage per bag. Pickup assures absorption of oil, greases, water and acids. It provides a dry, non-slip floor surface to reduce personal injuries and fire hazards caused by oily, slippery floors.

For more data circle **42** on Reader Service Card

★ ★ ★

Exhaust Silencer

An exhaust silencer, intended for use wherever "extra" quiet operation is desired on Torit cabinet-type dust collectors has been announced by Torit



Exhaust Silencer quiets dust collectors

Manufacturing Co., 287 Walnut St., St. Paul, Minnesota.

The silencer is available in five models to fit the exhaust openings on the 50, 60, 70 and 80 series and the Model 122 collectors.

The three smaller models extend 30 inches above the top of the collector to further reduce the noise effect; two larger models extend 36 inches above the collector. All five are rectangular in cross-section and are interlined with 1-inch closed cellular vinyl foam that is said to absorb approximately 80 per cent of the noise without significantly restricting air flow.

All Silencers can be attached to new Torit units or to collectors now in use.

For more data circle **43** on Reader Service Card

★ ★ ★

Conversion Coatings

Kenvert Chrome Sealer Type Films, designed to protect copper, zinc, brass, cadmium, and aluminum against tarnish, stains, fingerprints, and inside

corrosion have been announced by the Conversion Chemical Corporation, Rockville, Conn.

The sealers are also said to increase the adhesion of organic films. They are particularly recommended where the paint or lacquer film has been giving premature failure in the presence of moisture.

Many of the finishes brighten as well as protect. All finishes are produced by dipping.

Kenvert No. 32 helps eliminate the tendency for "spotting-out" on brass plate; and prevents staining and fingerprinting prior to lacquering.

For further data circle **44** on Reader Service Card

★ ★ ★

Hammered Finish

A hammered finish that has good hiding qualities and is durable, resistant to chemicals, wear and weather has been introduced by Minnesota Platon Corp., Pipestone, Minnesota.

"Poly-Ep" Platon is said to produce a finish that is resistant to cracking, chipping or peeling under impact; exceeds Federal paint specifications for rust inhibitive enamel; is unaffected by all common household chemicals, greases, acids and alkalis; and has excellent dielectric properties. It is a two component material, mixed in equal parts as needed, with a pot life of 8 hours or more.

The hammered finish may be applied to any metal surface by spray. It air dries dust free in 30 minutes, may

SPRAY BOOTHS

Newcomb Spray Booths are adaptable to manual, automatic, and electrostatic spray operations—floor or overhead conveying. Designed for minimum maintenance. Individual tanks or central sludge systems. Automatic sludge recovery systems.

Dip coating and Flow coating systems complete with ventilated drip areas and complete fire protection.

For Bulletins and Quotations, write to:

NEWCOMB-DETROIT

5761 RUSSELL ST. • DETROIT 11, MICH.

For more data circle **218** on Reader Service Card

be handled in 6 or 8 hours or it may be completely cured at temperatures up to 350 deg. F. in as little as 6 minutes' time.

It is available in various colors, in gloss or satin. Unusual decorative effects can be obtained by applying a regular "Poly-Ep" Platon color as a first coat and another color hammer finish as a second coat, permitting the first to show through.

For more data circle **45** on Reader Service Card

★ ★ ★

High Speed Mounted Wheels

A line of high speed resin bonded wheels and points, designed to operate at 20,000 r.p.m. and above, has been announced by American Diamond Saw Sales, 120 N. W. Ninth Ave., Portland 9, Oregon. ADS High Speed Mounted Wheels afford the metal finisher, particularly the stainless steel fabricator, faster cutting action and longer wheel life, states the manufacturer.

ADS High Speed Mounted Wheels and Points

ADS High Speed Mounted Wheels are coded to indicate the degree of hardness of the bond. They are available in the standard grits from 24 to 120 and sizes and shapes to conform to national standards.

For more data circle **46** on Reader Service Card

★ ★ ★

Dust Collector Bags

All Torit FB (bag-equipped) cyclone-type dust collectors are now furnished with after-filter bags of special Dacron cloth, according to Torit Manufacturing Co., Dept. KP, 287 Walnut St., St. Paul, Minnesota.

Dacron Filter Bag on Torit Dust Collector

Torit engineers have cited several advantages for the Dacron cloth: effective filter medium; will not burn when exposed to a continuous shower of sparks; will not shrink when laundered or be attacked by moths or mildew.

By using after-filters on Torit cyclones, a manufacturer can recirculate clean, heated air indoors, where regu-

lations permit, instead of exhausting it out of doors, thereby reducing space heating costs.

For more data circle 47 on Reader Service Card

★ ★ ★

Optical Surface Finish Comparator

An optical device for judging surface roughness has been announced by the Bausch & Lomb Optical Co., 625 St. Paul St., Rochester, N. Y.

The principle is embodied in a surface comparator which permits metal surfaces to be compared with a selected standard for roughness under 10-power magnification.

The comparator will speed up the work of set-up and production men and quality control inspectors who must make judgments regarding surface roughness.

A pocket-sized, hand-held instrument, the surface comparator operates on an optical principle which emphasizes surface irregularities. It illuminates both the known standard and the piece under study. When looking into the 10-power eyepiece, the user sees a circular image, one-half of which is the standard, the other half, the sample being checked. A comparison can thus be made quickly, using commercial roughness standard strips, or samples of satisfactory work.

The instrument is recommended for examining surfaces after milling, turning, grinding, planing, buffing, polishing, plating, painting, and lacquering.

The instrument is self-illuminated

preserve and protect chemically-cleaned and electroplated surfaces by dip or spray

WITH LAQUA

- **LAQUA** displaces water from a surface and at the same time deposits a thin protective film thereon. It eliminates the drying operation after plating.
- **LAQUA** does not interfere with electrical contacts.
- **LAQUA**-coated metals can be spot welded . . . it improves soldering operations.
- **LAQUA** prevents oxidation, sulfer discoloration and fingerprinting of parts during storing and handling.
- **LAQUA** resists salt spray and humidity.
- **LAQUA** can be recoated with almost all finishes.

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FIDELITY CHEMICAL PRODUCTS CORP.

472 Frelinghuysen Avenue, Newark, New Jersey

For more data circle 219 on Reader Service Card

with two pen-light batteries and a standard flashlight lamp. The 10-power Hastings lens turns for individual focusing of the image.

Illumination and viewing of the known standard and the work is achieved with a beam-splitting mirror. The standard comparison blocks are held in place by a spring-loaded clamp.

For more data circle 48 on Reader Service Card

Optical comparator introduced by Bausch & Lomb Optical Co. of Rochester, N. Y., provides a quick means for checking surface roughness. Operator shown here holds work to be examined up to the instrument. A standard surface roughness scale has been inserted at the end of instrument. User sees both surfaces in circular field of view under 10-power magnification (shown by inset, upper right)

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★ ★ ★

Chromic Acid Recovery Method

A patented method for recovering contaminated or spent chromic acid solutions typical of chromium plating, anodizing and copper stripping operations has been developed by the Mutual Chemical Division of Allied Chemical & Dye Corporation, 99 Park Ave., New York 16, N. Y., and is being made available for industrial use without the requirement of any formal license. U. S. Patent 2,733,204 was recently issued covering this method.

The process involves ion exchange treatment for removal of metallic contaminants of iron, copper, aluminum and other metals by passing solutions through a cation exchange resin consisting of a sulfonated infusible polymerizate of a polyvinyl aryl compound. Such treatment on a hydrogen cycle permits recovery of baths which have excessive metallic contamination or reduced acidity.

In relatively large operations the method is considered a useful engineering tool not only for decreasing the cost of chromium chemical treatments, but as a means of reducing waste treatment necessitated by increasing emphasis on eliminating stream pollution. Furthermore, it has been reported that the quality of plated and anodized work is improved by the use of these so-called decationized solutions.

For more data circle 49 on Reader Service Card

★ ★ ★

Corrosion-Proof Flooring Material

The Ceilcote Company, Inc., 4848 Ridge Rd., Cleveland 9, Ohio, has announced Corocrete "A", a corrosion-

proof floor material which provides increased protection from attack by alkalis, solvents and acids. Developed for application directly over concrete, the material is composed of three basic ingredients: (1) a thermosetting resin liquid, (2) a hardening agent, and (3) an aggregate-type filler.

The materials are mixed at the job site for immediate application. In instances where flooring is exposed to solvents, exposing the concrete base to attack by acids, Corocrete "A" can be used successfully, it is stated.

Corocrete "A" handles like cement topping and is applied in thicknesses from ¼ inch minimum to ¾ inch maximum (per layer). It cures quickly.

Abrasion tests show Corocrete "A" to be more resistant to abrasion than most concrete floors. Its physical strength is also greater than concrete, it is stated.

For more data circle **50** on Reader Service Card

Conversion Coating

Oakite ChromiCoat, a conversion coating for aluminum and zinc, designed to meet Specification MIL C-5541, has been introduced by Oakite Products, Inc., 20 Rector St., New York 6, New York.

The product is said to impart resistance to corrosion and to improve paint adherence. The ChromiCoat coating, which becomes integral with the treated metal surface, reduces paint chipping and flaking. If the surface should be damaged, the ChromiCoat treatment is said to confine corrosion within the area of the exposed metal—corrosion does not creep under the undamaged paint to cause blistering.

ChromiCoat is used at concentrations of 2 to 3 ounces per gallon of water at temperatures up to 100 deg. F. in either tank or washing machine.

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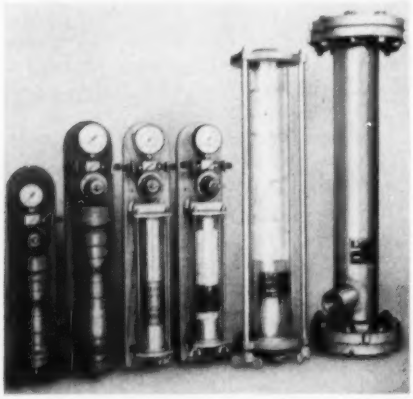
An experienced representative is available. Call . . . or write.

For more data circle **221** on Reader Service Card

Compressed Air Filter

The Sta-Dri filter for compressed air has been announced by Beach Precision Parts Company, Boonton, N. J. It is a highly absorbent cellular material that absorbs moisture and oil vapors without swelling or increasing in particle size. The manufacturer asserts that it will absorb both moisture and oil vapors, then divest itself of moisture, but not oil.

The Sta-Dri filter eliminates common forms of oil vapor damage and interference along with water and other particles. Reduction in flow of compressed air or gases through the filter elements is negligible; actual line drop is 3 to 7 per cent, it is stated.



Several Beach Sta-Dri Compressed Air Filters

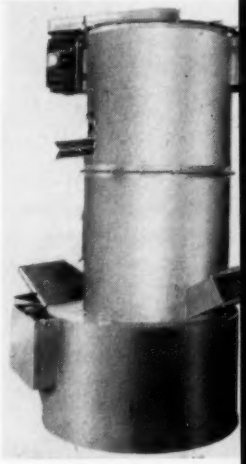
Produced in six models of varying capacities, the Sta-Dri is available with a container of clear plastic which shows visibly when filter elements are exhausted and when to drain water. Elements are replaced easily, using thumb screws or a wrench.

For more data circle **52** on Reader Service Card

★ ★ ★

Dust-Fume Collector

The Zack Company, Chicago, has announced floor type and cone type dust-fume collectors. Essentially, these units consist of a cylindrical drum and internal wash-producing structures.



Dust-Fume Collector

The units are reported to involve a cone and baffle design which is said to result in a "cyclonic" washing action. This, in turn, creates a turbulence which separates the wet dust and carries it to a sludge tank for removal.

In detail, the action produced by the Zack dust-fume collectors is: water, supplied by a direct driven pump, cascades downward within the collector. This action results in a series of closely related water curtains through which the dust and fume laden air is filtered in its upward travel. The dust and fume laden air is in continuous fluid contact during the upward flow. A double row of moisture eliminators, fabricated in convenient handling size, are mounted above the washing chamber. Access doors are provided in the housing for the inspection of eliminators and wash chamber.

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McKeon's "Liquid Sulphur"

Economical, fast, non-electrolytic.

Sulphur Products Co., Inc.

McKeon Bldg., 621 W. Pittsburgh St., Greensburg 6, Pa.

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The Zack dust-fume collectors are designed with a flat bottom. This serves as a settling tank from which the water is recirculated. A chute type of cleanout is provided for simple hand cleaning of settling tank. These wet type dust-fume collectors are also produced with a flight conveyor for automatic ejection of sludge from tank to a container.

The Zack dust-fume collectors are available in sizes and capacities from 500 c.f.m. to 40,000 c.f.m.

Descriptive literature and complete technical details on Zack wet type dust-fume collectors can be obtained by writing The Zack Company, 4600 West 12th Place, Chicago 50, Illinois.

For more data circle **53** on Reader Service Card

★ ★ ★

Pressure Pot

Sharpe Manufacturing Co. has announced a redesigned 2-gallon pressure material container which can hold one gallon paint cans. This one piece pot incorporates a roll lid for better gasket seating and longer life and improved

Pressure Pot holds one gallon can of paint

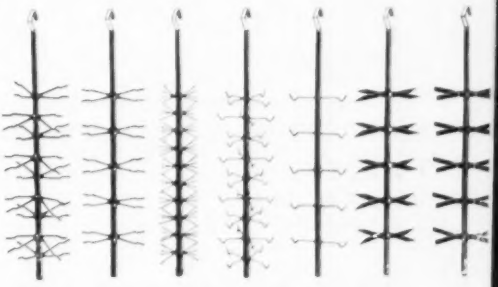
wing screw C clamps for speed and ease of operation.

Complete catalog is available from Sharpe Manufacturing Company, 1224 Wall Street, Los Angeles, Calif.

For more data circle **54** on Reader Service Card

Plating Racks

Belke Manufacturing Company, 947 N. Cicero Ave., Chicago, Ill., has announced Belke Ready Made Economy Racks.



Belke Ready-Made Plating Racks: Versatility

These racks are designed to handle a wide variety of parts. They have 100 per cent copper spines; all tips, wherever practical, are riveted and soldered or brazed for continuous conductivity and rigidity; every contact wire tip is of phosphorous bronze; insulation is 100 per cent solids plastisol.

For more data circle **55** on Reader Service Card

★ ★ ★

Porosity Test Paper

A method for making rapid porosity tests on tin, nickel and chromium plating is provided by Detect-O-Pore Test Paper, a product of R. P. Cargille Laboratories, Inc., 117 Liberty St., New York 6, New York.

To use, this test paper is moistened with buffer solution, made with a buffer powder furnished, and then pressed down on the surface to be

Dispenser of Detect-O-Pore Test Paper

tested. Pores are shown by dark spots that develop on the paper. The test is said to be very sensitive.

Detect-O-Pore Test Paper can also be used to indicate the metal under plating because iron and steel give a greenish blue color, copper and brass give a brown color. Also, the same test paper indicates pin holes in enamel, or other protective coating over these metals and it shows up minute rust spots on stainless steel.

For more data circle 56 on Reader Service Card

★ ★ ★

Spray Gun Exchange Unit

The DeVilbiss Co., 300 Phillips Ave., Toledo 1, Ohio, has announced a dual purpose package for DeVilbiss exchange spray guns.

DeVilbiss Exchange Unit open for display

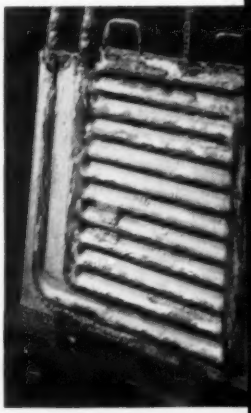
Designated as an exchange unit, each package is uniform in size, with the type of spray gun being identified by model numbers stamped on the carton. The spray gun is enclosed in a transparent pliofilm bag within the package. The carton can be reused to return the worn gun for rebuilding.

For more data circle 57 on Reader Service Card

★ ★ ★

Special Alloy Platecoils

Platecoils are now available in several special alloys to extend their application in corrosive, highly acid, and other specialized industrial processes, according to Tranter Manufacturing, inc., Platecoil Division, Lansing 4, Michigan.



Platecoil heat transfer unit after a year's severe usage without cleaning

Platecoils are heat-transfer units designed for the application or removal of heat. They consist of two embossed metal sheets welded together to provide a preformed channel for the flow of heating or cooling media.

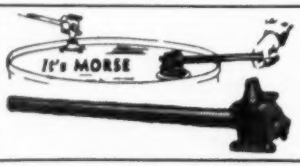
Alloys available, and their recommended applications, include:

Type 316 Stainless Steel. Used in a variety of applications including phosphate coating, electroplating, paints and varnishes, and for cooling sulfuric acid in anodizing applications.

Send NOW for this FIT-ALL

DRUM PLUG WRENCH

Instantly loosens, tightens 95% all plugs or bungs in steel drums. Has 16" extra-strong steel tubing handle. Wgt. only 2 lbs. Order 1 or more today!



THOUSANDS IN USE saving time, labor, accidents!

SATISFACTION GUARANTEED..... $3.60

Non-sparking type $5.60

Plus Parcel Post

MORSE MFG. CO., Inc.

762 W. Manlius St., E. Syracuse, N.Y.

For more data circle 223 on Reader Service Card

Monel. Particularly recommended for water applications of all types, including salt water.

Carpenter 20. Designed to provide maximum corrosion resistance to sulfuric acid.

Hastelloy 'B' and 'C.' Alloy 'B' is particularly well suited for use in hydrochloric acid, up to the boiling point. Alloy 'C' is considered the most universally corrosion-resistant alloy available today.

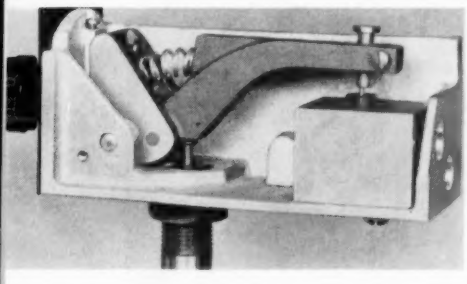
Nickel. Commercially pure 'A' nickel is used in fabrication of Platecoils. In addition to its resistance to a wide range of corrosive solutions, nickel is almost completely resistant to corrosion by alkalies, including caustic soda.

For more data circle **58** on Reader Service Card

★ ★ ★

Temperature Control

Burling Model DA Pneumatic Temperature Control, a product of Burling Instrument Co., 16 River Rd., Chatham, N. J., is designed for use where



Operating mechanism of Temperature Control

temperature is controlled by varying the flow of gas, steam, or other medium with an air-operated valve or motor.

It may be used in any pneumatic system up to 50 p.s.i.g. and will reduce the output or branch line pressure as temperature increases. Since it operates by the differential expansion of solids and uses no liquid or vapor fill, it is available for temperatures up to 1800 deg. F.

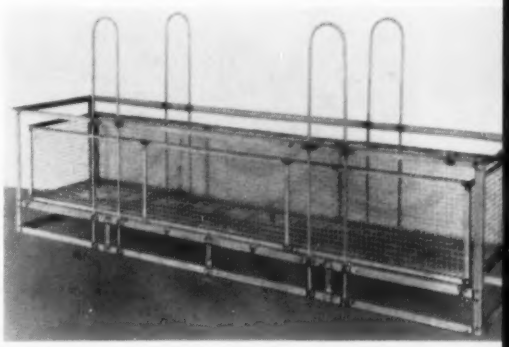
Temperature adjustments are made with knob on front of case. Throttling ranges are fixed, but may be specified as narrow as 5 degrees or as wide as 100 degrees.

For more data circle **59** on Reader Service Card

★ ★ ★

Degreasing Basket

A degreasing basket designed to hold heavy extra-long parts such as aircraft frames, shafts, and other long sections has been announced by the Wiretex Manufacturing Co., 40 Mason St., Bridgeport, Conn.



Wiretex Degreasing Basket for Large Parts

Combining two sections, a basket and frame, with the basket being nested in the frame, it holds a maximum number of pieces in a minimum of space, with the largest possible surface area of each part exposed to permit draining or cleaning. Loading and unloading are easy.

The frame is 11 feet long, 29 inches wide, and 33 inches deep. It is made of stainless steel.

The basket is 26 inches by 10½ feet by 20 inches deep.

For more data circle **60** on Reader Service Card

New Books

METAL PREPARATION. How to prepare metals for painting is the subject of a new, illustrated folder issued by **Wyandotte Chemicals Corporation.** In addition to describing the use of Wyandotte Pre-Fos, this folder, F-2374, also gives information on paint strippers, rust removers, metal conditioners and metal cleaners—both alkaline and emulsion.

The folder contains operating charts

for metal working companies and job paint shops. A photographic case history describes the ability of Pre-Fos to clean and phosphate in one operation to give exceptional paint adhesion and low use-cost. Copies of this folder are free to all who prepare metals for painting by writing Wyandotte Chemicals Corp., Industrial Sales Dept., Wyandotte, Mich., or Los Nietos, Calif.

★ ★ ★

ABRASIVE BELT GRINDING. "How Abrasive Belt Grinding Increases Production," a booklet of 46 illustrated case histories, is available from the **Engelberg Huller Company,** Syracuse, N. Y.

Application studies are grouped according to each of five types of abrasive belt machining—platen, contact wheel, formed wheel, centerless, and flexible belt, and cover a wide range of materials—ferrous and non-ferrous metals, glass, wood, and plastics.

Specific advantages of belt surfacing are discussed in each study.

Address requests on company letterhead, with title, to **Engelberg Huller Company, Inc.,** 831 W. Fayette St., Syracuse 4, N. Y.

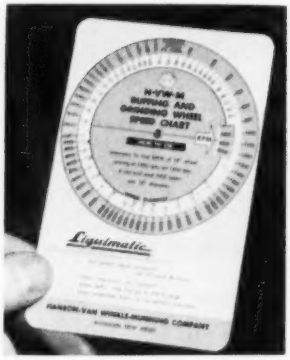
★ ★ ★

ADHESIVE SELECTOR CHART. Chart lists the most common materials used in bonding operations and indicates the recommended rubber based DC adhesive for mating these materials. Copies of the chart may be secured by writing the **Daubert Chemical Co.,** 333 N. Michigan Ave., Chicago 1, Ill., on your business letterhead.

★ ★ ★

SPEED CHART FOR BUFFING AND GRINDING. A handy disk chart for determining the surface speed of buffing and grinding wheels is available from the **Hanson-Van Winkle-Munning Company.**

The chart enables one quickly and easily to know the surface speed, in feet per minute, of any wheel from 1 inch to 60 inches in diameter, turning at spindle



Buffing and Grinding Wheel Speed Chart

speeds of from 220 to 20,000 r.p.m.

Requests for the buffing and grinding wheel speed chart should be sent to John S. Karinja, Hanson-Van Winkle-Munning Co., Church St., Matawan, N. J.

AUTOMATIC PAINTING MACHINE. A brochure on a stationary gun pressure contact automatic painting machine is available to anyone requesting it from **Conforming Matrix Corporation,** 380 Factories Building, Toledo 2, Ohio.

It includes illustrations and a complete description of the PC1S self-contained, completely enclosed, air operated machine designed for single color decorating of small and medium size parts.

★ ★ ★

PRECIOUS METALS. A catalog listing products and specifications has just been released by **Sigmund Cohn Corp.,** 121 S. Columbus Ave., Mount Vernon, New York.

Whole sections are devoted to electro-

plated, etched or coated wires, plating solutions (rhodium and gold), galvanometer suspension strips, Wollaston Process Wire. Many helpful tabulations for handy reference appear throughout the catalog. Copies of the authoritative catalog are available by requesting them on company letterhead.

★ ★ ★

SALT & WATER, POWER & PEOPLE —By Robert E. Thomas. 109 pages. Published by **Hooker Electrochemical Co.,** Niagara Falls, N. Y.

A short history of the Hooker Electrochemical Company is the subject of this publication. It is a story of the people and processes who have played a part in the growth and development of this producer of many basic chemicals so important to industry today. Profusely illustrated, the book contains many interesting facts about Hooker as well as the chemical industry itself.

WATER STILL CATALOG. Catalog provides comprehensive technical information on the complete range of Barnstead Water Stills—from laboratory models to the large industrial units.

Useful reference book for anyone who

uses distilled water, whether it's for large-scale production operations, industrial research projects, or laboratory work. **Barnstead Still & Sterilizer Co.,** 12 Lanseville Terrace, Boston 31, Mass.

★ ★ ★

LINING COMPOUNDS. A unique "sampler" of a wide variety of Arco rubber and plastic lining compounds is available from the engineering staff of Automotive Rubber Company, Inc., Detroit.

The "sampler" is a folder carrying eleven actual specimens of rubber and elastomeric materials. The specimens represent compounds used in the majority of corrosion and abrasion resistant lining work performed by Arco engineers and technicians on tanks, vessels, pipe, fittings, duct work, fans, and other equipment.

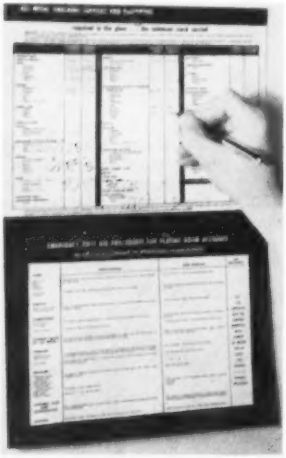
According to reports, Arco laboratory files carry hundreds of special rubber

compounds modified to meet unusual and severe corrosive and abrasive conditions.

For addtional details on the Arco "sampler" of rubber and plastic compounds, write to **Automotive Rubber Company, Inc.**, 12550 Beech Road, Detroit 39, Mich.

★ ★ ★

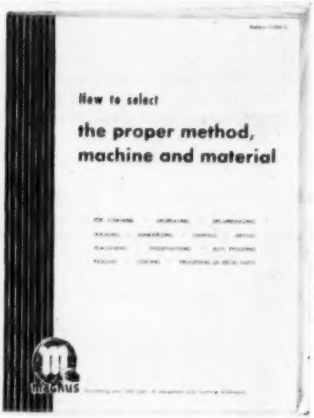
UTILITY FOLDER. A utility folder designed for the metal finishing and plating department is available from **Frederic B. Stevens, Inc.**, 1800 18th St., Detroit 16, Mich. This folder can be used for three purposes: a stock record to check finishing supplies inventory; an emergency first aid wall chart outlining treatment for plating room accidents; or, a file folder to file technical bulletins and sales literature supplied by supplier sales engineers.



The Stevens utility folder may be hung on the wall and used as an inventory check list (top) and an emergency first aid chart (bottom)

★ ★ ★

CLEANING EQUIPMENT. Available from the **Magnus Chemical Company, Inc., Equipment Div.,** Dept. PF, Garwood, N. J., manufacturer of industrial cleaning equipment and materials, is a booklet entitled "How to Select the Proper Method, Machine and Material."



This manual shows various types of cleaning equipment, and contains technical material which will help industrial plants in the selection of the method, material and machine best suited to their problems.

★ ★ ★

Principles of Industrial Waste Treatment, by Dr. C. Fred Gurnham. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 399 pages. Price, $9.50.

Approaching the subject from an operational or unit operations point of view, this book deals with the sources, pollutional effects, and methods for the treatment and disposal of liquid wastes produced by industry.

Dr. Gurnham first deals with the effects of wastes on streams and sewerage systems. Following this, he examines the criteria developed by the sanitary engineer for evaluating pollution; physical, chemical, organic, and biological properties are considered separately.

The greater part of the book covers the operations and processes used to treat industrial wastes before their discharge into natural waters or municipal sewers. In the three chapters devoted to physical treatment, Dr. Gurnham analyzes sedimentation, filtration, and heat transfer operations. The four chapters on chemical treatment consider pH adjustment, oxidation and reduction, coagulation and chemical reaction, and adsorp-

tion and ion exchange. The discussion of biological treatment includes biological filtration, activated sludge, and lagoons. Anaerobic biological treatment and miscellaneous methods are also covered. Disposal programs and brief descriptions of industries with major disposal problems conclude the volume.

★ ★ ★

"The Lorco Method of Precision Barrel Finishing for Metals and Plastics," 44 pages; published by Lord Chemical Corp., Dept. AB, 2068 South Queen St., York, Pa. Price, 50 cents.

This practical handbook tells how to tumble and to get the best results and effect maximum production savings. Simple, basic techniques, developed around a series of 27 chemical compounds, used with or without fused aluminum-oxide chips and other media are described.

Two of the six chapters cover general procedures for metal parts, ferrous and non-ferrous; a third chapter is devoted to the new technique of barrel finishing of plastic products. Much of the material in this chapter is based upon original research studies and has never before been described in print.

The remaining three chapters are devoted to compounds and their specific purposes.

★ ★ ★

Porosity of Electrodeposited Metals. A.E.S. Research Report Serial No. 28. Project Director, N. Thon; associates, Denis G. Kelemen, Ling Yang, Stella Yang, Douglas Dean. Published by the American Electroplaters' Society, 445 Broad St., Newark 2, N. J. Price, $.85.

This is a report on A.E.S. Research Project No. 6, conducted at the Frick Chemical Laboratory, Princeton University, Princeton, N. J.

This report contains four sections, the first of which deals with the subject of the "Hydrogen Content of Electro-Deposited Metals." This section is devoted to a discussion of experimental results found in determining the amounts of hydrogen occluded in different metals, electrodeposited under different conditions.

The second section is entitled "Analysis of Corrosion Products as a Method of Measuring the Change of Porosity in Corrosion." It is devoted to a discussion of the development of a method by which the progress of corrosion could be determined, as a fuction of time of exposure, in objectively meaningful units, and correlated with the porosity of a protective coating.

The third section of the report is devoted to discussion of a method of evaluating the distribution of surface corrosion from the point of view of its uniformity, since this is of interest in studying the early occurrence of local failures in coatings and their subsequent effect in hastening the occurrence of depth corrosion.

The final section, entitled "Variation of the Gas Permeability Constant With Pressure Difference," discusses an improved permeability apparatus by means of which measurements have been made over larger foil areas.

★ ★ ★

Specifications and Tests for Electrodeposited Metallic Coatings. This compilation of 17 specifications, methods of test, and recommended practices embodies the work of ASTM Committee B-8 on Electrodeposited Metallic Coatings. These ASTM Standards in the field of electrodeposition of metals have either been developed jointly with the American Electroplaters' Society, or have had subsequent endorsement by this group. 104 pages. Price, $1.85. Copies available from A. S. T. M. Headquarters, 1916 Race St., Philadelphia 3, Pa.

The last issue of the B-8 compilation was October, 1953, and since that time all but 5 of the 17 standards have been revised. Many of the revisions have been based on extensive research projects within the committee, including long-time atmospheric exposure tests of copper-nickel-chromium plated steels.

The book contains specifications for zinc, cadmium, nickel-chromium, and lead on steel; nickel-chromium on copper; nickel-chromium on zinc; and chromate finishes on zinc coatings. In addition there are recommended practices for preparation of low-carbon steel, high-carbon steel, zinc-base die castings, and copper-base alloys for electroplating; chromium plating on steels; and preparation of and electroplating on stainless steel and aluminum alloys. Methods of test include tests for local thickness and two spray tests—the salt spray (B 117) and the acetic acid-salt spray (B 287).

★ ★ ★

SANDING BOOK. A book on metal finishing containing 32 pages and 82 photos and charts of step-by-step instruction for every phase of metal sanding for novices and experts alike. Price, $0.25. Write **Behr-Manning,** Troy, N. Y., Dept. GG-10.

Candid Camera Captures Conventioneers

Fig. 1—Convention activities start at the Registration Desk. Almost 1500 persons registered during the A.E.S. 43rd Annual Convention.

Fig. 2—Arthur G. Pierdon, general chairman, presided at the Opening Session on Monday, June 18. Dr. Allen V. Astin, National Bureau of Standards, delivered Keynote Address.

Fig. 3—(Below) First social function of the Convention was the A.E.S. Get Together Party, which was held Sunday evening in the Presidential Room of the Hotel Statler, Washington, D.C.

Fig. 4—The Metal Finishing Suppliers' Association held a luncheon and meeting. New officers are: president, J. J. Duffy, Jr., Pennsylvania Salt Mfg. Co.; 1st vice president, M. M. Beckwith, Harshaw Chemical Co.; 2nd vice president, E. W. Couch, Lea Mfg. Co.; 3rd vice president, Ray F. Ledford, Industrial Filter & Pump Mfg. Co.; treasurer, T. A. Trumbour, Finishing Publications, Inc.; past president, Herman J. Struckhoff, Laco Engr. & Sales, Inc. Trustees are: George A. Stutz, Geo. A. Stutz Mfg. Co.; John A. Bauer, Hanson-Van Winkle-Munning Co.; Sherman Goble, Federated Metals Division, American Smelting & Refining Co.; H. D. McLeese, Metal & Thermit Corp. A. P. Munning, Munning & Munning, Inc., is executive secretary.

Fig. 5—The National Association of Metal Finishers held their Fifth Management Seminar during the Convention. New officers and directors of the group are (left to right): Phil J. Ritzenthaler; Morris Ranno; W. B. Knight, 2nd vice president; P. Peter Kovatis, executive secretary; Sal Novelli, asst. secretary-treasurer; J. Robert Greenwell, 1st vice president; John A. Palik, Jr., president; Harold W. Baker; S. C. Taormina, technical advisor; Ralph W. Timberlake; Henry J. Siegel; Frank Kaiser, secretary-treasurer. Directors not shown in photograph are: Dave Griffin, J. Eisenberg, and Paul E. Miller. Some 300 job plating shops are members of N.A.M.F.

Fig. 6—(Below) Traditional M. F. S. A. Open House and Dance was held Monday evening.

Fig. 7—Electrochemical Alumni of Michigan State University held their Annual Luncheon.

Fig. 8—Lloyd Gilbert (left) asks a queston of A. H. Du Rose following the presentation of his paper. G. A. Lux (center) served as moderator of this session. Forty-two papers were presented during the Convention. This establishes an all-time record for number of papers given.

Fig. 9—(Left) Vernon A. Lamb discussed "Chromium Plating of Gun Bores." Arthur W. Logozzo (left) served as session's moderator.

Fig. 10—(Below) F. O. Beuckman spoke on "Dissolved Gases in Plating Baths." Dr. Wm. Blum was the moderator for this session.

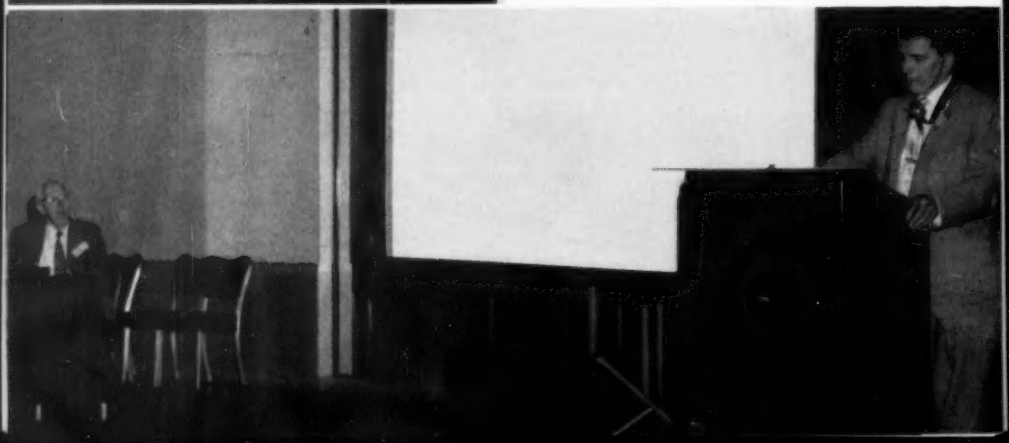


Fig. 11—Ladies' Luncheon, sponsored by The Udylite Corp., was held in the Grand Ballroom of the Mayflower Hotel. Dr. Richard B. Saltonstall, technical director of Udylite, spoke on "What the Quality of Plating Means to You." After lunch, the annual Plato Party was given.

Fig. 12—At the A.E.S. Business Meeting, Louis M. Hague (left), president of Hanson-Van Winkle-Munning Co., accepted from Cylde Kelly an Award of Merit presented to Myron B. Diggin, vice president of H-VW-M. Mr. Diggin was ill and unable to attend.

Fig. 13—An Award of Merit was presented to Rudy Hazucha, Clinton Company, by President Kelly. These awards are made in recognition of service to the American Electroplaters' Society, local A.E.S. Branches, and the electroplating industry in general.

Fig. 14—(Below) G. Stuart Krentel, Kelite Corporation, made a successful bid for the 1960 A.E.S. Convention, which will be held in Los Angeles. A.E.S. officials shown (left to right) are: Clyde Kelly, past president for 1956-57; R. D. Wysong, 3rd vice president; Dr. Samuel Heiman, president; Mr. Krentel; John P. Nichols, executive secretary; Francis T. Eddy, 1st vice president.

Fig. 15—Final Banquet of the Convention was held in the Presidential Room of the Hotel Statler. Banner in background urges all to attend the 1957 A.E.S. Convention to be held in Montreal, Canada, from June 17-20 in the Sheraton-Mount Royal Hotel.

Fig. 16—The Japanese Metal Finishing Association was represented at the Convention by Y. Ukai of Tokyo. Shown in this photo taken during the Annual Banquet, are (left to right): C. R. Konecony, General Electric Co.; Mrs. Konecony; A. E. Carlson, General Chemical Div., Allied Chem. & Dye Corp.; Y. Ukai; Ezra A. Blount, editor of "Products Finishing"; Wm. B. Stephenson, Jr., General Electric Co.; William Young, Bill Young & Co., Inc.; Mrs. Young; Miss Young.
(All photographs by PRODUCTS FINISHING)

Page 143

News of the Industry

New plants . . . company news . . . new positions . . . meetings . . . honors . . . societies.

NEW PLANTS

Norton Company's new grinding wheel plant at Santa Clara, California, was officially opened recently.

This plant, which makes a complete line of grinding wheels, including diamond wheels, incorporates the latest developments in the industry. These include many pieces of equipment and methods developed at Norton's main plant in Worcester, Mass. Typical of these are the automatic electric tunnel kilns which accurately control the temperatures of the kilns during firing, automatic molding machines for small diameter wheels which ensure complete uniformity of the size and density of the finished product, dust control equipment which ensures clean air, and modern handling equipment which reduces manual handling.

At the present time, about 80 people are employed at the Santa Clara plant. Manufacturing began late in 1955 with the first grinding wheels being produced in December.

On hand to greet the visitors during the official opening in addition to Milton P. Higgins, president of the company, were the plant manager, George A. Garrison; Ralph F. Gow, executive vice president; John Jeppson, vice president in charge of manufacturing, Abrasive Division; Ralph M. Johnson, vice president in charge of sales, Abrasive Division; Donald L. Price, sales manager, Abrasive Division; and Elliott B. Knowlton, Public Relations manager.

Also on hand were the following West Coast representatives: Harry G.

Norton Company's recently-opened grinding wheel plant in Santa Clara, California

Brustlin of Los Angeles, Norton district manager for the West Coast, and William J. Sweeney, of San Francisco, regional manager for Behr-Manning Company, a Norton division.

★ ★ ★

A general contract has been awarded to the George A. Fuller Company of New York City, associated with John P. Pettyjohn & Co. of Lynchburg, Va., for construction of a new plant at Lynchburg, to house the Rectifier Department of the **General Electric Company.**

Max I. Alimansky, general manager of the department, has announced that completion of the plant is scheduled for early spring of 1957.

★ ★ ★

Plans to build a new Administrative Center have been announced by **The Dow Chemical Company,** Midland, Michigan.

The Center in its final form will be a group of buildings in an area almost a half mile long and a quarter mile wide containing headquarters for the entire company.

★ ★ ★

Black Manufacturing Company, manufacturer of Black Arrow spray guns and accessory spraying equipment, has expanded facilities and operations and moved to new quarters at Livingston, New Jersey. The new plant will replace the former installation at Harrison, New Jersey.

As an integral part of a projected five year growth program, the **Pennsylvania Salt Manufacturing Company,** Philadelphia, Pa., has announced further expansion of operations in the Republic of Mexico. Nearing completion at Navojoa, Sonora in the northwestern area is a new agricultural chemical processing plant and distribution center. This plant provides an expansion of Pennsalt de Mexico's central plant and office facilities in Mexico City.

Minerales ye Metales Industriales, another subsidiary in Mexico has completed its first year of fluorspar mining activities in the San Luis Potosi area.

Operating abroad as Pennsalt International Corporation, Philadelphia, the company also has growing exporting, importing, and manufacturing interests throughout Central and South America.

★ ★ ★

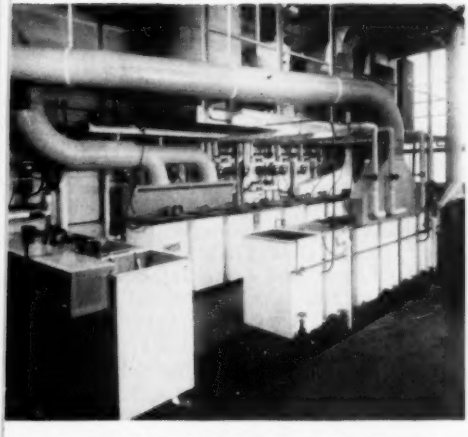
Staticote Systems, Inc., manufacturer of electrostatic spraying systems and equipment, has moved to 13747 South Western Avenue, Blue Island, Illinois.

The new location is the first step in an expansion program. It is estimated that the new facilities will more than quadruple those of the old plant.

★ ★ ★

Manufacturers who clean, plate or finish metal parts of all types now have available a new Customer Service

Newly built plant to house Black Manufacturing Company. Location: Livingston, New Jersey.



New MacDermid Customer Service Laboratory

Laboratory at **MacDermid, Inc.**, Waterbury, Connecticut.

Utilizing the latest in metal finishing techniques and materials, the new laboratory enables MacDermid engineers to duplicate under rigid control the processing cycle of almost any metal finishing plant. By taking advantage of these laboratory facilities at MacDermid, manufacturers will be able to analyze and solve metal cleaning, plating and finishing problems.

COMPANIES

Detrex Corporation, Detroit, has announced that it will purchase all the outstanding capital stock of **Hooker-Detrex, Inc.** Hooker Electrochemical Co. is negotiating for the sale to Detrex of its interest in Hooker-Detrex. Detrex thus will become the sole owner of the chemical plant at Ashtabula, Ohio, which is the second largest trichlorethylene production unit in the country and a large producer of anhydrous hydrogen chloride. The Tacoma, Washington, plant of Hooker-Detrex will be transferred to Hooker, but it will continue to serve as a chemical supply source for Detrex.

Detrex is now completing near-term expansion plans which will include enlarging its trichlorethylene and hydrogen chloride facilities. Other chemical products are being produced experimentally in its chemical research laboratories which will serve as the basis for further expansion.

Upon completion of the acquisition of Hooker-Detrex, Incorporated, Detrex will consolidate all its subsidiary companies under the name of **Detrex Chemical Industries, Inc.**

Detrex will continue to operate two plants in Ashtabula, Ohio, two plants in Detroit, Michigan, and one plant in Bowling Green, Kentucky, and will maintain its present offices and warehouses in all principle cities of the United States.

★ ★ ★

William R. Moore, retired vice president of **Norton Company,** has recently returned from Japan, where he was a member of a five-man panel of American business experts who spent several weeks holding a series of seminars in that country to help introduce modern American business methods.

The tour was sent to Japan by the National Cooperation Administration of the Department of State, through the cooperation of the Council for International Progress in Management.

★ ★ ★

The **Van der Horst Corp.,** Olean, N. Y., conducted a seminar on electroplated surface finishes in their New York laboratory and plant recently.

Electroplated chromium, porous chromium and Vanderloy (electrolytic iron) and their applications for engineering purposes were reviewed.

★ ★ ★

The Lea Mfg. Co., Waterbury, Conn., was one of nine other companies in Connecticut to receive recognition by American Airlines on their Twentieth Anniversary of the Air Travel Plan. Richmond G. Terry and Curtis A. Tucker of American Airlines presented an award to Earle W. Couch, president of The Lea Mfg. Co., saluting the company as a 20 year subscrib-

R. G. Terry and C. A. Tucker, American Airlines, with Earle W. Couch, Lea Mfg. Co.

er to the Plan and a member of the fraternity of firms who were first to recognize the benefits of the Air Travel Plan and pioneer its use.

★ ★ ★

Shell Chemical Corporation has announced that its high boiling lacquer solvent, ethyl amyl ketone, is now available in tankcar quantities.

EAK is colorless and stable, with a mild, pleasant odor. Its applications include automotive lacquers, furniture lacquers, industrial maintenance vinyl coatings and silk-screen lacquers.

★ ★ ★

Detrex Corporation, Detroit, Michigan, has entered into an agreement to manufacture and merchandise all package-type conveyors, plus other items owned and previously manufactured by **B & G Machinery Company** of Indianapolis, Indiana, it was announced by Detrex president, A. O. Thalacker.

These products are principally in the laundry and drycleaning field and will be manufactured at the new Detrex drycleaning equipment plant in Bowling Green, Kentucky.

Lloyd Byrne, president of B & G Machinery Company, advises that B & G will continue to develop and produce material handling equipment for special application.

★ ★ ★

The **Middle Atlantic Company,** Long Island City, N. Y., headed by John H. Herz, has been appointed to represent the **Pennsylvania Salt Manufacturing Company,** Metal Processing Department, in the New York Metropolitan, West Chester and Long Island areas. The franchise covers Pennsalt's full line of metal cleaners, Fosbond and Foscoat products, Metal Processing Chemicals sales manager, John M. Davidson, has announced.

★ ★ ★

A team of 23 European paint, varnish and lacquer manufacturers recently visited the **DeVilbiss Company,** Toledo, Ohio, to view demonstrations of spray painting equipment used in industrial and maintenance applications. Included in this group were Dr. Curt H. Dold, Wallisellen-Zuerich, Switzerland, head of the Swiss Paint, Varnish & Lacquer Assn., and Erich V. Schmid, St. Margarethen, Switzerland, president of the federation of paint technicians of Europe.

John M. Ehni, DeVilbiss director of export sales, shows spray gun to Europeans, Dr. Curt H. Dold (left) and Erich V. Schmid (right).

The annual sales meetings for distributors of the **Bede Products Corporation** were held recently in Amherst, Ohio. The meetings were conducted in two separate divisions, providing a week each for Eastern and Western distributors.

Eric Nord, president, presided over both sessions, at which members of the company discussed the past year's progress, recent technical developments, and future sales aids and advertising. The distributors were also advised of plans for scheduled training school classes for installation, operation and maintenance of the Bede Airless Spray Coating equipment and paint heaters.

The meetings were held in Bede's newly built Technical Laboratory and Training Center. The new building provides facilities for equipment development, testing of paint formulations for the Airless Spray Coating process, and for use as a Training School.

★ ★ ★

A series of regional meetings, held in New York, Cleveland, Chicago, Detroit, and Los Angeles, has given **Parker Rust Proof Company** representatives an insight into expected developments in surface treatments for metals in the immediate future.

Primarily, the meetings were designed to help Parker technical representatives serve customers better. Trends in business and manufacturing, and developments in many fields were covered, with special attention on the new Parker products which are contributing to these developments.

Latest information on Parker Pre-Namel 410, the pre-treatment for steel before porcelain enameling, indicates

Bede Products Corporation Eastern (upper photo) and Western (lower photo) District Distributors

that full production use is only a few months off. Parker Pre-Namel promises to help produce better enameling at lower cost.

Bonderites of the 700 Series are becoming increasingly important as the automotive and aircraft industries turn to aluminum as a replacement for steel and costly copper. The opportunity for service to customers through the 700 Series Bonderites was emphasized.

Parker field men were also given a progress report on the quarter-million-dollar expansion which is under way in the customer service laboratory in the Detroit plant. When completed, this big department will include a commercial-size conveyorized automatic Bonderite machine, a multi-stage strip machine with a capacity of 40-inch coiled or sheet steel, and new salt spray and humidity test rooms with greatly increased capacity.

★ ★ ★

W. M. Campbell, president of the **Magnus Chemical Company, Inc.,** Garwood, N. J., manufacturer of cleaning compounds, has held an International Sales Conference, the first of its kind in this country, to discuss new and improved methods of cleaning. The conference began May 28, at the Winfield Scott Hotel, Elizabeth, N. J., and ended on June 1st.

★ ★ ★

The **Esbec Barrel Finishing Corp.,** Byram, Conn., has announced the appointment of the **Illinois Deburring Co.,** 3159 W. Madison, Chicago, as northern Illinois representative for Esbec products.

Illinois Deburring offers a free sample-processing service, an in-plant engineering service, and a free training course for customers' personnel.

★ ★ ★

Maas & Waldstein Company, Newark, N. J., has announced that Plextone, the color flecked textured enamel manufactured by the company, is guaranteed for a full year when used for building purposes.

NEW POSITIONS

Metal & Thermit Corporation, Rahway, N. J., has named **Owen Richards** as manager of the new mine and titanium ore dressing plant under development at Beaver Dam, Hanover County, Virginia.

Owen Richards

H. D. McLeese

H. D. McLeese has been elected a vice-president of **Metal & Thermit Corporation,** Rahway, N. J., H. E. Martin, president, has announced.

Mr. McLeese will direct sales, market development and research and advertising of all Metal & Thermit and United Chromium products. He is also a vice-president of Metal & Thermit-United Chromium of Canada, Ltd.

★ ★ ★

The **Electro Minerals Division** of **The Carborundum Company,** Niagara Falls, N. Y., has assigned four abrasive grain specialists to the field, according to George R. Rayner, Jr., sales manager of the division. They are: **R. Stanley Burt, Edward J. Schultz, Robert A. Murphy,** and **Joseph M. Morin.** Mr. Rayner stated that this is the first time that Carborundum has employed grain specialists in the field. Formerly abrasive grain and powders were sold by salesmen who also sold grinding wheels and coated abrasives.

R. Stanley Burt's territory will cover metropolitan Chicago and parts of Wisconsin, Illinois and Iowa.

Edward J. Schultz will cover Michigan and Toledo, Ohio.

Robert A. Murphy will have the New England area.

Joseph M. Morin will cover metropolitan New York and New Jersey.

Three appointments as district sales managers for the **Coated Abrasives Division** of **The Carborundum Company** have been announced.

Augustus T. Murray, coated abrasives sales manager for the Buffalo and New England Districts, has been transferred to the Central District as sales manager for the Buffalo and Pittsburgh areas, with headquarters at Niagara Falls, N. Y.

Oliver P. Quist, coated abrasives sales manager of the Chicago District, has been transferred to the Eastern District as sales manager for the New England and New York areas, with headquarters at West Springfield, Mass.

William J. Reid, coated abrasives salesman at Detroit, has been promoted to sales manager for the Midwestern District with headquarters at Chicago, Illinois.

Boyd Johnson, general manager of the Refractories Division of **The Carborundum Company** in Perth Amboy, N. J., has been elected vice president of the company.

Mr. Johnson joined The Carborundum Company in 1920 as a maintenance engineer and subsequently during his 36 years of service has held responsible positions in practically every phase of the super refractories business.

Leslie E. Simon, Major General, U. S. Army (retired), formerly assistant chief of Ordnance for research and development of the U. S. Army Ordnance Corps, has been appointed director of the Research and Development Division of **The Carborundum Company,** according to an announcement by Clinton F. Robinson, president.

Harry C. Martin has retired from the position of director of research and development. With the company for 42 years, he served 2 years beyond normal retirement age by request of the president. Mr. Martin will continue as a vice president of the company.

Edward J. Kubis has become manager of industrial sales, Industrial, Railroad and Aircraft Department, **Wyandotte Chemicals Corp.,** Wyandotte, Michigan.

Edward J. Kubis

Thomas W. Wise

Thomas W. Wise has been appointed general sales manager of the **W. H. Brady Co.,** Milwaukee, Wis., manufacturer of self-sticking products.

★ ★ ★

The appointment of **Stanford J. Barlett** as manager, Washer Division, has been announced by **Circo Equipment Company,** Clark (Rahway), N. J., manufacturer of cleaning equipment for the metal working industry.

Mr. Barlett's responsibilities will include complete supervision in sales, design and manufacturing metal parts, washers and dryers or complete finishing systems.

★ ★ ★

W. M. Barr & Company, Memphis, Tennessee, manufacturer of removers and cleaning compounds, has announced the appointment of **Fred L. Lawrence, Jr.,** as general sales manager.

Mr. Lawrence will be in charge of the company's entire sales department in the continental United States. His first project will be the reorganization and expansion of the sales department for industrial removers, metal-treatments and cleaning compounds.

James A. Viola has been appointed to the board of directors at **Hanson-Van Winkle-Munning Co.**, Matawan, N. J., according to an announcement from the company.

Mr. Viola is closely associated with the metal finishing company, in that he is currently engaged in directing the H-VW-M program of greatly expanding its rectifier manufacturing facilities and increasing its output of an improved type of germanium rectifier.

Mr. Viola is head of Rapid Electric Co. of New York, being the principal founder of this company when it was organized in 1945.

Paul A. Waalkes

James A. Viola

Paul A. Waalkes has been named assistant manager of compound sales for **Hanson-Van Winkle-Munning Co.**, Matawan, N. J., according to an announcement from the company.

In this capacity Mr. Waalkes will direct H-VW-M's program for formulating and developing metal finishing compounds at the J. C. Miller Division, Grand Rapids, Mich.

★ ★ ★

At a recent directors' meeting of **Park Chemical Company,** Detroit, Mich., W. P. Woodside, Jr., president, announced that the following men were elected officers by the board: **H. D. Kitchen,** executive vice-president and secretary; **C. R. Foreman,** vice-president in charge of sales; and, **Robert J. Mitchell,** treasurer.

Park Chemical has been manufacturing heat treating materials and automotive chemicals since 1911.

★ ★ ★

According to an announcement by Dr. John H. Lux, president of **Haveg Industries, Inc.,** Marshalltown, Delaware, plans for an expansion program have been launched by the company.

As part of the overall expansion plans, **C. R. Runk** has been named director of Public Relations, and **Roland G. E. Ullman Organization, Inc.,** of Philadelphia, Pa., has been appointed to handle all phases of the advertising and public relations work for Haveg. Also, two new divisions of the company have been organized.

★ ★ ★

Election of **Fred McCarthy** as vice president of sales and **Wayland W. Rice** as vice president in charge of manufacturing for **Barreled Sunlight Paint Company,** has been announced by Elbert D. Peck, president of Barreled Sunlight and vice president, paint and brush division of **Pittsburgh Plate Glass Company.**

Mr. McCarthy has served as general sales manager of Barreled Sunlight during the past five years.

Mr. Rice had been vice president and technical director of U. S. Gutta Percha Paint Company and also serv-

Henry A. Solie

Fred McCarthy

ed as vice president of operations for Barreled Sunlight between 1951 and the purchase of Barreled Sunlight by Pittsburgh Plate in 1954 when he became general manager of production.

★ ★ ★

Appointment of **Henry A. Solie** as sales manager for **Barreled Sunlight Paint Company** has been announced by Fred McCarthy, vice president of sales. Barreled Sunlight had been purchased by **Pittsburgh Plate Glass Company** as a wholly-owned subsidiary of Pittsburgh Plate.

Formerly, Mr. Solie had served as assistant general manager.

Richard T. Connors

Wayland W. Rice

Richard T. Connors has been appointed technical man servicing Cowles alkaline metal cleaners and Ty-Bond zinc phosphate metal coatings in Chicago and nearby cities. Mr. Conners' appointment has been announced by Earl F. Clark, manager, Metal Cleaner Dept. of **Cowles Chemical Company,** Cleveland, Ohio.

★ ★ ★

Universal Paint & Varnish, Inc., Bedford, Ohio, has announced the appointment of **Rollo J. Kidd** to the technical staff.

Mr. Kidd will concentrate on new products and on further development of Uni-Mulsion*, a water-thinned industrial finish.

*Reg. U. S. Patent Office

Charles G. Rigdon has been appointed to the newly created post of barrel finishing engineer for **Frederic B. Stevens, Inc.,** Detroit 16, Michigan.

Mr. Rigdon's responsibilities will extend over the entire country in the capacity of assisting regular Stevens sales engineers with barrel finishing problems.

★ ★ ★

Two promotions and two appointments have been announced by **Kelite Products, Inc.,** Berkeley Heights, N. J. manufacturer of industrial cleaners and cleaning equipment.

Albert W. Lupien, former sales manager of the midwestern area has been promoted to regional vice president,

Albert W. Lupien

W. John Boyd

G. Stuart Krentel

Gurdon T. Henry

while **W. John Boyd** has moved from supervisor to district sales manager of Metropolitan Chicago.

G. Stuart Krentel and **Gurdon T. Henry** have been appointed manager of technical sales for the western region and district sales manager in the Ohio area, respectively.

★ ★ ★

James Dacey has been appointed sales representative for the **Binks Manufacturing Company** in the Syracuse, N. Y., area. Mr. Dacey fills the vacancy occasioned by J. C. Rommes' recent retirement.

Mr. Dacey may be contacted at 110 Rider Ave., Syracuse 4, N. Y.

A new address has been announced for **George Sherwood,** sales representative for the **Binks Manufacturing Company** in the Buffalo, New York area. Mr. Sherwood may be contacted at 477 Elmwood Ave., Buffalo 22, N. Y.

★ ★ ★

Promotion of **F. Lindsay Power** to division engineer for coated abrasives has been announced by **Minnesota Mining & Manufacturing Co.,** St. Paul, Minnesota.

Vincent Meyer has been promoted to assistant division engineer for coated abrasives, it has been announced by **Minnesota Mining & Manufacturing Co.,** St. Paul, Minn.

SOCIETIES

The **National Association of Metal Finishers,** an organization of job shop owners and management officials in the finishing and plating industry, elected the following officers for 1956-57: president, **John A. Palik, Jr.,** Cleveland; 1st vice president, **J. Robert Greenwell,** Chicago; 2nd vice president, **W. B. Knight,** Detroit; secretary-treasurer, **Frank Kaiser,** Long Island; and assistant secretary-treasurer, **Sal Novelli,** Brooklyn.

P. Peter Kovatis of Cedar Grove, N. J., has been named executive secretary of the association.

Mr. Kovatis, who recently resigned from the American Electroplaters' Society, comes to the N.A.M.F. with more than 15 years of administrative and public relations experience. A graduate of Boston University where he attended the School of Public Relations and Communications, and the College of Business Administration, he also attended Harvard University and Massachusetts Institute of Technology where he pursued several courses under the auspices of the Bay State University Extension.

(Left to right) P. Peter Kovatis, executive secretary; W. B. Knight, Knight Plating Co., 2nd vice president; J. Robert Greenwell, Reliable Plating Co., 1st vice president; John A. Palik, Jr., National Plating Corp., president; Sal Novelli, Service Plating Co., assistant secretary-treasurer; Frank Kaiser, Long Island Mechanical Plating Co., secretary-treasurer.
The new officers were elected on June 17. (Photograph by PRODUCTS FINISHING.)

HONORS

Atlas Powder Company has announced the names of eight top college chemistry and engineering students who have been awarded $1,000 Atlas scholarships.

Atlas president Ralph K. Gottshall listed the winners as: Robert F. Bridger, Missouri School of Mines; Donald R. Haring, Lafayette College; Peter P. Saunders, Northeastern University; Ronald G. Harber, University of Minnesota; Leonard Berkowitz, Polytechnic Institute of Brooklyn; Frederick W. Camp, Columbia University; Ira W. Levin, University of Virginia; and Stephen W. Tobey, Illinois Institute of Technology.

★ ★ ★

Rear Admiral John A. Snackenberg, USN, Commandant of the First Naval District, has made the first New England presentation of the Department of Defense Reserve Award to **Norton Company,** Worcester, Mass.

This recently authorized award was established to honor companies whose policies regarding employee-reservists serve to encourage active participation in reserve activities.

meetings

OF INTEREST TO FINISHERS

Jul. 28. Annual Stag Day, Detroit Branch, American Electroplaters' Society, Glen Oaks Country Club, Detroit, Mich.

Sept. 5-8. 59th Annual Convention of The International Association of Electrotypers and Stereotypers, Inc., Lake Louise, Alberta, Canada.

Sept. 16-21. Annual Meeting, American Chemical Society, Convention Hall, Atlantic City, N. J.

AGATEEN

Baking Lacquer No. 13-C

Produces a tough, durable film. Metal can be sheared, blanked and processed after finishing with

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For more data circle 224 on Reader Service Card

Sept. 16-22. Pacific Coast Meeting, American Society for Testing Materials, Statler Hotel, Los Angeles, Calif.

Sept. 20-21. Semiannual Meeting, American Hot Dip Galvanizers' Association, Greenbrier Hotel, White Sulphur Springs, W. Va.

Sept. 25-28. 1956 Iron and Steel Exposition and Annual Convention of the Association of Iron and Steel Engineers, Cleveland Public Auditorium, Cleveland.

Oct. 8-12. National Metal Congress & Exposition, American Society For Metals, Public Auditorium, Cleveland Ohio.

Oct. 21-24. 34th Annual Meeting and 21st Paint Industries Show, Federation of Paint and Varnish Production Clubs, Netherland Plaza Hotel, Cincinnati, Ohio.

Oct. 28-Nov. 1. Fall Meeting, Electrochemical Society, Inc., Hotel Statler, Cleveland, Ohio.

For Free Literature Circle Numbers on Card Inside Front Cover

PRODUCT LITERATURE

83. Buffers—Polishers
Catalog illustrates and describes 16 different types and sizes of buffing and polishing machinery. The Standard Electrical Tool Co., 2518 River Rd., Cincinnati 4, Ohio.

84. Finishing Equipment
Catalog describes company's line of dust control systems, industrial ovens, blast cleaning equipment and tumbling mills. The W. W. Sly Manufacturing Co., 4784 Train Ave., Cleveland 1, Ohio.

85. Portable Plating Unit
Catalog sheet illustrates and describes the Sel-Rex "Jet" Plater — a complete electroplating unit in a compact, portable cabinet. Bart-Messing Corp., 229 Main St., Belleville 9, N. J.

86. Paint Stripping
Heavy deposits of organic finishes, even the chemical resistant finishes such as epoxies, can be stripped quickly using the Kolene process of immersion in a molten salt bath. Bulletin shows how it's done. Kolene Corporation, 12894 Westwood Ave., Detroit 23, Mich.

87. Stop Corrosion
Polyvinyl chloride resists a wide variety of corrosive chemicals. Folder describes sheet, pipe, fittings, valves, fans, duct work, hoods, tanks, and pumps made of this material for installation in applications where corrosion is a problem. S & C Manufacturing Co., 6245 Wiehe Rd., Cincinnati 13, Ohio.

88. Tumble Finishing
Booklet gives helpful information on the Roto-Finish process for maintaining exact tolerances on precision parts with no significant dimensional changes. Roto-Finish Co., 3704 Milham Rd., Kalamazoo, Mich.

89. Metal Treating Machines
Description of machinery used in the treatment of metal prior to plating and painting. Includes batch type and conveyorized washers, tumbling machinery, chip washers, pickling machines, sawdust dryers and accessories. Ransohoff, Inc., 610 N. Fifth St., Hamilton, Ohio.

90. Points for Better Galvanizing
Bulletin G1-F tells how galvanizing operations can be improved with the aid of Promat Pre-Galv. Promat Div., Poor & Co., 851 S. Market St., Waukegan, Ill.

91. Vapor Degreasing
Booklet gives the story of new developments in vapor degreasing. Subjects covered include vapor degreasing principles, selection of vapor degreasing cycles, cleaning by ultrasonics, and properties of Triclene D. E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Dept. PF-6, Wilmington 98, Delaware.

92. Protect Plated Surfaces
Information on Laqua, a material that can be applied by dipping to protect plated or chemically cleaned surfaces. Displaces water, thus eliminates drying step. Fidelity Chemical Products Corp., 472 Frelinghuysen Ave., Newark, N. J.

93. Solvent Detergent
Folder describes the properties of a solvent detergent which is said to clean and protect against rust at the same time. The material, Oakite Composition No. 98, was designed especially for use in power washing machines. Oakite Products, Inc., 20 Rector St., New York 6, N. Y.

94. Fans
Bulletin 545 describes, illustrates and gives specifications for general purpose fans designed for use with duct systems. New York Blower Co., 32nd and Shields Ave., Chicago 16, Ill.

95. Corn Products
Information on industrial corn products for use in tumbling, burnishing, polishing, drying and blasting. Iowa Corn By Products Co., Box 187, Nevada, Iowa.

96. Tumbling Machine
Facts on the new Model H Baird Tumbling Machine. The Baird Machine Co., Dept. PF, Stratford, Conn.

97. Plating Stop-off
Descriptive literature on Miccrostop, a material used for masking of machined parts in all plating operations, to produce hairline demarcation. Michigan Chrome and Chemical Co., 8615 Grinnell Ave., Detroit 13, Mich.

98. Polishing Wheel Cement
A folder describing Ad-Lea-Sive, a glue-base adhesive, may be obtained from The Lea Mfg. Co., Waterbury 20, Conn. Complete information and general and special instructions for the use of this adhesive are given.

99. Horizontal Plating Barrels
Catalog shows complete line of barrel plating equipment, includes helpful data sheets on depositing cadmium, copper, nickel, tin, and zinc. Lasalco, Inc., 2820 LaSalle St., St. Louis 4, Mo.

100. Silk Screens
Information on silk screens for all industrial decorating processes. Cincinnati Screen Process Supplies, Inc., 43 Walnut St., Cincinnati 2, Ohio.

101. Electronic Thickness Tester
Helpful information is contained in a booklet of questions and answers about the Kocour Electronic Thickness Tester, which is used to measure thickness of various metals deposited over many types of metallic and non-metallic bases. Kocour Co., 4814 S. St. Louis Ave., Chicago 32, Ill.

102. Finishing Systems
Complete information on integrated systems for surface preparation, painting, air make-up, and conveying. George Koch Sons, Inc., Dept. P-66, Evansville, Ind.

103. Heat Transfer Equipment
Bulletin 600-2 describes "tailor-made" heat exchangers for meeting individual performance specifications. Industrial Filter & Pump Mfg. Co., 5904 Ogden Ave., Chicago 50, Ill.

104. Trichlorethylene Degreasing
Illustrated booklet contains valuable data on the use and handling of trichlorethylene degreasing solvent. Hooker Electrochemical Co., 4737 Buffalo Ave., Niagara Falls, N. Y.

105. Polishing Flat Surfaces
Detailed information and recommendations for more efficient polishing operations on flat surfaces. The Hill Acme Co., 1209 W. 65th St., Cleveland 2, Ohio.

106. Sulfamate Nickel Plating
Technical bulletin describing a versatile nickel plating process. Called Sulfamate Nickel Plating, the patented process can produce nickel deposits with considerable variations of stress, hardness, tensile strength, elongation, ductility and electrical resistivity properties. It is applicable to a wide variety of engineering and functional uses. Hanson-Van Winkle-Munning Co., Matawan, N. J.

107. Radiant Ovens
Information on high-production radiant ovens. Burdett Manufacturing Co., 4916 S. Monitor Ave., Chicago 38, Ill.

108. Abrasive Media
Catalog shows sizes and shapes of controlled size and shape abrasive media for barrel finishing. Speed-D-Burr Corp., 3613-e San Fernando Rd., Glendale 4, Cal.

109. Roller Coating
Information on equipment for roller coating. Gasway Corporation, 6463 N. Ravenswood Ave., Chicago 26, Ill.

110. Electroplating Data Chart
Technic chart provides at a glance all related and comparative data on gold, rhodium, palladium, platinum, silver and nickel. Technic Inc., 39 Snow St., Providence 1, Rhode Island.

111. Chemical Polishing Aluminum
Folder describes method of obtaining satin to mirror bright finishes and removing burrs from aluminum parts. Alchemize Corp., 1430 S. Talman Ave., Chicago, Ill.

112. Precision Painting
Booklet tells how Fiore spray masks, jigs, fixtures and spray machines can be used to paint die castings and stampings that have depressed or raised detail and on other irregular shaped surfaces. Wm. M. Fiore, Inc., 269 41st St., Brooklyn 32, N. Y.

113. Silicone Paints
Complete data on silicone finishes plus a list of silicone paint formulators. Dept. 5006, Dow Corning Corp., Midland, Mich.

114. Metal Finishing Systems
Bulletin 51 contains suggestions, tips and ideas on ways to achieve better flinishes, faster production and smoother handling of numerous products such as power tools, automobile frames and refrigerators. Despatch Oven Company, 619 S. E. Eighth St., Minneapolis 14, Minn.

115. Washing Machine Cleaner
Bulletin tells how Cowles QC Washing Machine Cleaner gives improved wetting and emulsifying action without foaming in washing machines. Cowles Chemical Co., 7016 Euclid Ave., Cleveland 3, Ohio.

116. Vacuum Coating
Technical data and information on equipment for vacuum metallizing process, which can be used to produce attractive metallic finishes on name plates, escutcheons and other articles in minimum time. Consolidated Vacuum, a division of Consolidated Electrodynamics Corp., Rochester 3, N. Y.

117. Automatic Painting Machines
Brochure on an automatic rotary gun spray painting machine and an automatic rotary wiping machine. Includes description of machine for painting round and deep-draw parts, which are difficult to hand spray because of their intricate design. Conforming Matrix Corporation, 356 Factories Building, Toledo 2, Ohio.

118. pH Papers
Data sheet describes pH papers, which can be used for determining the pH of any aqueous solution. Tells how to order papers to cover the range desired. Paul Frank, 118 E. 28th St., New York 16, N. Y.

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119. Hot Spray Equipment
Bulletin describes 6 ways that the hot spray method can improve paint finishing. Also tells how to achieve maximum benefits from this method of application. The DeVilbiss Co., Toledo 1, Ohio.

120. Vapor Degreasing Equipment
Handbook on Vapor Degreasing Equipment gives technical information on cleaning metal by the vapor degreasing process. Circo Equipment Co., 51 Terminal Ave., Clark (Rahway), N. J.

121. Buffing Die Castings
Catalog describes advantages of the Churchill Finger Buff No. 150 DN, developed specifically for buffing die castings. Geo. R. Churchill Co., Inc., Dept. PF, Hingham, Mass.

122. Barrel Finisher
Data sheet gives specifications and construction features of the Almco Model DB-50 Barrel Finisher and the HP-50 Almco Hoist Pan. Almco Div., Queen Stove Wks., Inc., 82 Marshall St., Albert Lea, Minnesota.

123. Contact Wheels
Data sheet shows how the Cosmo Expander slotted rubber contact wheel improves efficiency of polishing operations. Chicago Rubber Co., Inc., 2620 Clybourn Ave., Chicago 14, Ill.

124. Direct Current Generators
Advantages of Chandeysson motor generators are detailed in a bulletin obtainable from the Chandeysson Electric Co., 4082 Bingham Ave., St. Louis 16, Mo.

125. Spray Booth Maintenance
Information on how to keep spray booth walls free of overspray build-up using Liquid Envelope strippable spray booth coatings. Better Finishes & Coatings, Inc., 268 Doremus Ave., Newark 5, N. J.

126. Do-It-Yourself Plating Racks
Bulletin 1415S gives instructions for assembling plating racks with Thinker Boy Members and Removable Tips. These components can be assembled into shapes to accommodate almost all plating requirements. Belke Manufacturing Co., 947 N. Cicero Ave., Chicago 51, Ill.

127. Using Sandpaper
Pocket-size booklet offers help to the shop worker in choosing and correctly using the proper sandpaper for surface finishing of metals. Dept. G, Behr-Manning, division of Norton Company, Troy, New York.

128. Rhodium Plating Handbook
Detailed data, technical information and applications for rhodium plating. Baker & Co., Inc., 113 Astor St., Newark 5, N. J.

129. Electronic Painting System
A system for spraying paint using conventional automatic spray guns and ionizing electrodes to give the paint particles a charge as they leave the gun. The ware is grounded, thus attracts the charged paint particles. Bulletin contains complete technical information on this process. Ashdee Electrostatic Products, Inc., 18032 Dixie Highway, Homewood, Ill.

130. Copper Anodes
Advantages obtained in electroplating with Oxygen-Free High-Conductivity Anodes are described in two booklets. Amco Publication CA-11 contains pilot-plant data on the metallurgical facts underlying the advantages of these anodes. Amco Publication CA-10 highlights the metallurgical data in simplified style and explains the technical advances in terms of practical electroplating advantages. American Metal Co., Ltd., 61 Broadway, New York 6, N. Y.

131. Plastisols
Details on plastisols and primer systems designed for rack coating and tank lining. Chem Products, Inc., Rocky Hill 10, Conn.

132. Alodizing
Faster processing of aluminum strip being anodized is described in literature on the Alodizing process. American Chemical Paint Co., Ambler 14, Pa.

133. Paint Bonding
Full particulars on Paintbond, a zinc-iron phosphate coating applied directly to metal before painting to improve adhesion and corrosion resistance. Detrex Corp., Box 501, Detroit 32, Mich.

134. Honite Finishing
"Facts and Figures Report on Honite Barrel Finishing" shows typical examples of advantages to be gained by finishing parts with the Honite method of barrel finishing. Minnesota Mining and Manufacturing Co., Dept. FI-66, St. Paul 6, Minnesota.

135. Glidden Facts
Booklet entitled "An Introduction to the Glidden Company" describes scope of the company's activities and products. The Glidden Co., 11005 Madison Ave., Cleveland 2, Ohio.

136. Nickel Brightener
Technical information on Nickelite Barrel Nickel Brightener, a concentrated product for producing brighter, more corrosion resistant nickel plate. Platers Research Corp., 59 E. 4th St., New York 3, New York.

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Space in this section is available for *Classified Advertising*. For rates and other information address:

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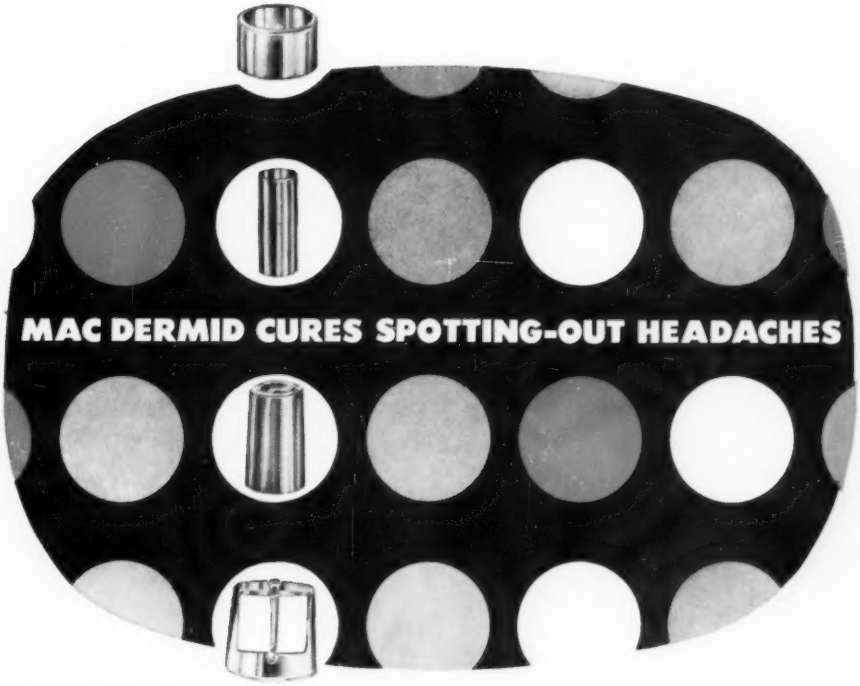

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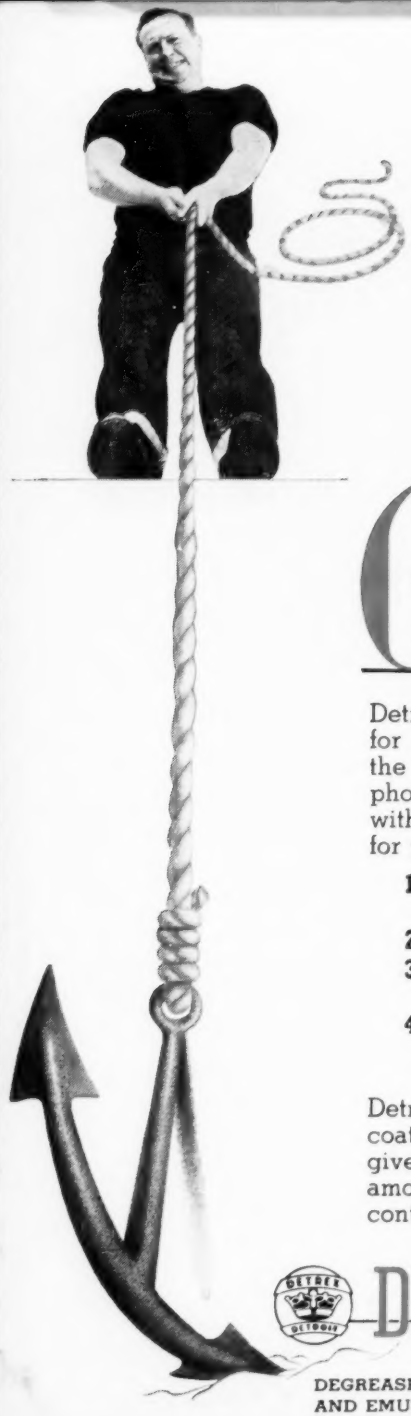

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